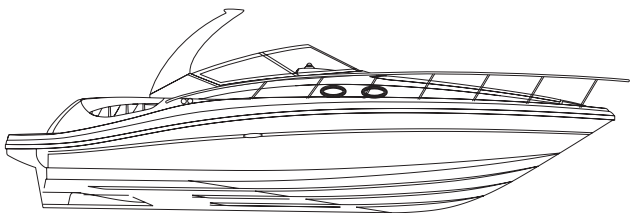
Sea Ray Owner's Manual

Sea Ray

340 Sundancer

International • 375 Sundancer



Owner's Manual Part Number: MRP 1803610

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Welcome

Congratulations on becoming the new owner of the world's most prestigious boat. We at Sea Ray® Boats, Inc. welcome you into our worldwide and ever-expanding family of boating enthusiasts.

The Owner's Manual Packet, to be kept on board your Sea Ray, gives you important information on all the features of your Sea Ray, for years of trouble-free boating take the time to carefully review the information in your Owner's Manual Packet and really get to know your boat. **Have everyone who will operate your boat read this manual.**

The Owner's Manual Packet contains the following:

- **Owner's Manual** : The Owner's Manual gives you important operating and safety information, as well as reminding you about your responsibilities as a boat owner/operator.
- **Original Equipment Manufacturer (OEM) Information:** This section of your Owner's Manual Packet contains information from the manufacturers of equipment installed on your boat. Examples include the engine, engine control and steering system. Throughout the Owner's Manual you will be referred to information provided by manufacturers of specific systems.

Because your purchase represents a substantial investment, we know you will want to take the necessary measures to protect its value. We have outlined a program for proper operation, periodic maintenance and safety inspections. We urge you to follow these recommendations. If you have questions which are not fully covered by the Owner's Manual Packet, please consult your authorized dealer for assistance.

Thank You For Selecting A Sea Ray®!

Bon Voyage

Introduction

1. This Manual

The material here and in the rest of the Owner's Manual Packet:

- Gives you basic safety information;
- Describes the features of your boat;
- Describes the equipment on your boat;
- Describes the fundamentals of boat use; and
- Contains service and maintenance information.

You must learn to operate this boat as well as read, understand and use this manual.

What this manual does not give you is a course in boating safety, or how to navigate, anchor or dock your boat. Operating a power boat safely requires more skills, knowledge and awareness than is necessary for a car or truck.

2. Your Responsibilities

For your safety, the safety of your passengers, other boaters and people in the water, you must:

- Take a boating safety course;
- Get instruction in the safe and proper handling of your boat;
- Understand and follow the "rules of the road";
- Learn how to navigate.
- Registration: In addition to the registration requirements for your boat in the state where it is used most frequently. Many states require additional registration when an out-of-state boat is used within their boundaries. Contact state boating authorities or any marine dealer for registration requirements.

3. Sources of Information

In North America, contact one of the following for boating courses:

- U.S. Coast Guard Auxiliary
- U.S. Power Squadron
- Canadian Power and Sail Squadrons
- Red Cross
- State Boating Offices
- Yacht Club

Contact your dealer or the Boat/U.S. Foundation at
1-800-336-2628

Outside of North America, contact your boat dealer and/or your governmental boating agency for assistance.

A book that provides a comprehensive background in boating is Chapman - Piloting, Seamanship and Small Boat Handling, by Elbert S. Maloney, published by Hearst Marine.

4. Dealer Responsibilities

In addition to a pre-delivery check and service of the boat, your dealer is to give you:

- A description and demonstration of the safety systems, features, instruments and controls on your boat;
- An orientation in the general operation of your boat;
- An "In Service Form" completed by you and the dealer after your inspection of the boat;
- A review of all warranty information and how to obtain warranty service;
- The complete Owner's Manual Packet.

If you do not receive all of these materials, or have any questions, contact your dealer or call: 1-800-SRBOATS.

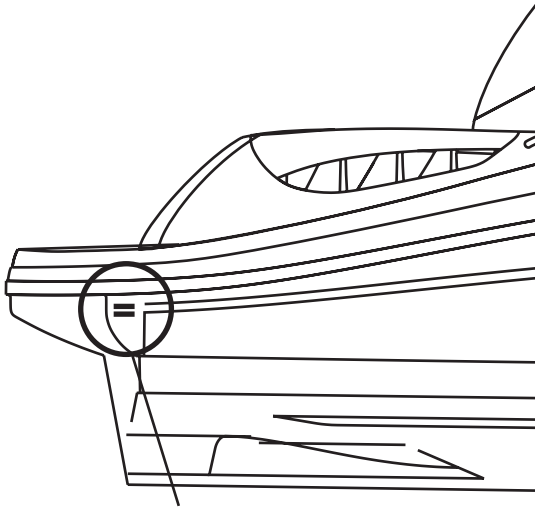
5. Warranties

Your boat comes with several warranties. Each component and/or system on your boat has its own warranty that will be found with the specific information and manual for that component. These are included with your Owner's Manual Packet. Locate and read the individual warranties; then put them together for easy future reference. The Sea Ray® warranty is on the warranty information card in your packet.

6. Hull Identification Number (HIN)

The "Hull Identification Number" located on the starboard side of the transom, is the most important identifying factor and must be included in all correspondence and orders. Failure to include it creates delays. Also of vital importance are the engine serial numbers and part numbers when writing about or ordering parts for your engine. Refer to the Engine Operator's Manual for locations of engine serial numbers and record them for future reference.

Hull Identification Number Location
(Fig. iv.1)



7. Manufacturer's Certification

As a boat manufacturer, Sea Ray builds their products to guidelines established under the Federal Boat Safety Act of 1971. The Act is promulgated by the United States Coast Guard who has authority to enforce these laws on boat manufacturers that sell products in the United States. Sea Ray ensures that all of its products comply with these laws.

The NMMA, National Marine Manufacturers Association, provides Sea Ray with a third party certification. The NMMA is an organization that represents the marine industry and assists manufacturers, boat dealers, marinas, repair yards and component suppliers in areas of legislation, environmental concerns, marine business growth and state and federal government agency interaction. The third party certification that Sea Ray participates in, uses the well know Standards and Recommended Practices of the ABYC, American Boat and Yacht Council.

Sea Ray Boats participates extensively in the American Boat and Yacht Council which is a non-profit organization that develops and publishes voluntary standards and recommended practices for boat and equipment design, construction, service and repair. We utilize all applicable ABYC standards in the construction of your Sea Ray boat.

Finally, Sea Ray sells their products world wide and as such must conform to the various rules and regulations required by other countries. Most notably, are the ISO standards in Europe which require the application of the CE (Common European) mark. This mark, much like the NMMA certification here in the US, gives you the boat owner specific information concerning your craft. For more on this, turn to Section 1 • Safety, subsections 8 and 13 which explains in detail the CE plate and its importance.

8. Service, Parts and Repair for Your Boat

When your boat needs service, parts or repair, take it to an authorized Sea Ray® dealer. To find a dealer in your area call:

Domestic: 1-800-SRBOATS
Fax: 1-314-213-7878
(International: 1-314-216-3333)

To find repair and parts facilities for the equipment installed on your boat, refer to the manual for that component.

If a problem is not handled to your satisfaction:

1. Discuss any warranty-related problems directly with the service manager of the dealership or your sales person. Give the dealer an opportunity to help the service department resolve the matter for you.
2. If a problem arises that has not been resolved to your satisfaction by your dealer, contact Sea Ray® Boats at 1-800-SRBOATS (International 1-314-216-3333) and the appropriate customer service department information will be provided

About Your Limited Warranty

Sea Ray offers an express Limited Warranty on each new Sea Ray purchased through an authorized Sea Ray dealer. A copy of the Limited Warranty was included in your owner's packet. If for any reason, you did not receive a copy of the Limited Warranty, please contact your local dealer or call 1-800 SR BOATS for a replacement copy.

Under the Limited Warranty, Sea Ray covers structural fiberglass deck or hull defects which occur within five (5) years of the date of delivery and parts founds to be defective in factory material or workmanship within one (1) year of the date of delivery. In addition, laminate blisters resulting from defects in factory material or workmanship are covered for five (5) years on a prorated basis.

Sea Ray's obligation under the Limited Warranty is limited to repair or replacement of parts that are judged defective by Sea Ray and does not include transportation, haul out, or other expenses. The foregoing is the **sole and exclusive** remedy provided by Sea Ray.

The Limited Warranty does not cover engines, stern drives, controls, propellers, batteries, trailers, or other equipment or accessories carrying their own individual warranties, nor does the Limited Warranty cover engines, parts or accessories not installed by Sea Ray. The Limited Warranty does not cover cosmetic gel coat finish. Boats used for commercial purpose are excluded from coverage. **See the Sea Ray Express Limited Transferable Warranty for other exclusions.**

SEA RAY EXPRESSLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. NEITHER SEA RAY NOR THE SELLING DEALER SHALL HAVE ANY RESPONSIBILITY FOR LOSS OF USE OF THE BOAT, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS OR CONSEQUENTIAL DAMAGES.

The unexpired term of the Limited Warranty may be transferred to a subsequent owner upon the new owner's written request to Sea Ray Division of Brunswick Corporation, 2600 Sea Ray Blvd., Knoxville, Tennessee, 37914 and payment to Sea Ray of Fifty Dollars ($50.00).

Thank you for your decision to buy a Sea Ray.

The Sea Ray Express Limited Transferable Warranty is subject to change at any time at Sea Ray's discretion. The information contained herein is general information about the Limited Warranty for the owner's general knowledge, but does not alter or amend the terms of the Limited Warranty.

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Information in this publication is based upon the latest product specifications available at printing. Sea Ray® Boats, Inc. reserves the right to make changes at any time, without notice, in the colors, equipment, specifications, materials and prices of all models, or to discontinue models. Should changes in production models be made, Sea Ray® is not obligated to make similar changes or modifications to models sold prior to the date of such changes.

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(International 1-314-216-3333)

Internet Address: http://www.searay.com

Note: Not all accessories shown in pictures or described herein are standard equipment or even available as options.
Options and features are subject to change without notice.

The following are registered trademarks of the Brunswick Corporation:
Sea Ray® & The SR Wave Logo

SAFE boating means:

- Knowing the limitations of your boat;
- Following the rules of the road;
- Keeping a sharp lookout for people and objects in the water;
- Not boating in water or weather conditions that are beyond the boat's and the operator's capability;
- Never go boating when the operator is under the influence of drugs or alcohol;
- Being aware of your passenger's safety at all times; and
- Reducing speed when there is limited visibility, rough water, nearby people in the water, boats, or structures.

Boating in beautiful weather and calm water conditions can be a wonderful experience. Pleasurable boating, however, requires considerably greater skills than operating a land vehicle. To obtain these skills, you must:

- Take a Coast Guard, U.S. Power Squadron or equivalent boating safety course. **Call the Boat/U.S. Foundation at 1-800-336-2628 for information on available courses.**
- Get hands-on training on how to operate your boat properly.

In addition:

- Maintain your boat and its safety and other systems as recommended in this manual.
- Have the boat inspected by a qualified mechanic or dealer, at least annually.
- Ensure that the Coast Guard required safety equipment is on board and functions. (See page 1.3).

1. Safety Labels

Safety precautions are given throughout this manual and labels are mounted at key locations throughout the boat. This safety information advises the owner/operator and passengers of imperative safety precautions to follow when operating and/or servicing equipment.

- Figures 1.19.1 through 1.21.1 shows the location of the safety labels on your boat.
- Do not remove or obstruct any safety label.
- Replace any label which becomes illegible. Replacement safety labels can be obtained by calling your dealer or Sea Ray at 1-800-SRBOATS (International 1-314-216-3333) for information on how to contact the manufacturing facility for your boat.

The meaning associated with each of the four basic types of label is:

⚠ DANGER

DANGER – Immediate hazards which WILL result in severe personal injury or death if the warning is ignored.

⚠ WARNING

WARNING – Hazards or unsafe practices which COULD result in severe personal injury or death if the warning is ignored.

⚠ CAUTION

CAUTION – Hazards or unsafe practices which could result in minor injury or product or property damage if the warning is ignored.

NOTICE

Information which is important to proper operation or maintenance, but is not hazard-related.

2. Legally Mandated Minimum Required Equipment

Consult your national boating law enforcement agency.

The following equipment is the minimum required by the U.S. Coast Guard for a boat 26' to less than 40' [7.9 meters to less than 12 meters] in length.

Personal Flotation Devices (PFD's): One Coast Guard approved Type I, II or III device is mandatory for each person aboard. One throwable Type IV device is also required to be on board. A Type V device is acceptable if worn for approved use. See Page 1.5 for a description of these PFD classifications. **Always wear a PFD when boating.**

Fire Extinguisher - Portable: If no fixed fire extinguishing system is installed in the engine and generator spaces, the U.S. Coast Guard requires **two** (2) **Type B-1 or one (1) Type B-2** fire extinguisher be on board. If your boat is equipped with a fixed fire extinguishing system in the engine and generator spaces, the U.S Coast Guard requires **one (1) Type B-1** fire extinguisher be on board. The American Boat and Yacht Council (ABYC) recommends that you have **three** (3) **Type B-1 ABC** fire extinguishers on board. One is to be located at the helm station and the other in the cabin, near the cockpit door.

Whistle, Horn: You must have on board some means of making a loud sound signal, for example, whistle or horn.

Visual Distress Signals: If you operate your boat in coastal waters or on the Great Lakes, you must have visual distress signals for day and night use on board. At least three (3) U.S. Coast Guard approved pyrotechnic devices marked with date showing service life must be carried, be readily accessible, in serviceable condition and not expired. Store pyrotechnic signals in a well-marked waterproof container in a dry location.

Other: Your Sea Ray is equipped with the required navigation lights, engine exhaust and ventilation systems.

3. Fire Extinguishing System

Your boat is equipped with an automatic fire extinguisher system, located in the engine compartment. In the event of a fire, the heat sensitive automatic head in the engine compartment will release a fire-extinguishing vapor, totally flooding the area.

The dashboard contains an indicator light for the automatic fire extinguishing system. The light will be ON when the ignition is on and indicates that the system is ready. If the light goes out while the ignition is on, the system has discharged.

WHEN DISCHARGE OCCURS, IMMEDIATELY SHUT DOWN ALL ENGINES, POWERED VENTILATION, ELECTRICAL SYSTEMS AND EXTINGUISH ALL SMOKING MATERIALS. DO NOT IMMEDIATELY OPEN THE ENGINE COMPARTMENT! THIS FEEDS OXYGEN TO THE FIRE AND THE FIRE COULD RESTART.

Wait at least fifteen (15) minutes before opening the engine compartment. This permits the fire-extinguishing vapor to "soak" the compartment long enough for hot metals and fuels to cool. Have portable extinguishers at hand and ready to use in case the fire reignites. Do not breathe fumes or vapors caused by the fire.

4. Carbon Monoxide

Symptoms of carbon monoxide poisoning are dizziness, ears ringing, headaches, nausea and

⚠ DANGER

Fumes from engine, generators, and other equipment and appliances using burning fuel contain carbon monoxide.

Carbon Monoxide can kill you.

Open all doors, curtains, windows, and hatches to let fresh air circulate, when running engine, generator or burning any fuel when boat is anchored, moored or docked.

⚠ DANGER

Even in rainy cold weather ventilation must be maintained to avoid Carbon Monoxide poisoning. You will get wet and/or cold.

⚠ DANGER

Sleeping on boat requires an operating Carbon Monoxide detection system in each sleeping

unconsciousness. A poisoning victim's skin often turns cherry red. Because carbon monoxide gas (CO) is odorless, colorless and tasteless, it is unlikely to be noticed until a person is overcome.

Dangerous concentrations of carbon monoxide will be present if:

- the engine and/or generator exhaust systems leak;
- insufficient fresh air is circulating where people are present; and
- fumes move from the rear of the boat into the cockpit and cabin area.

Figure 1.4.1 gives examples of boat operating conditions that can lead to high concentrations of carbon monoxide gas.

To minimize the danger of CO accumulation when the engine and/or generator are running, or using burning fuel applications.

- Be sure to have sufficient ventilation when using canvas or window-type side curtains when underway, anchored, moored or docked.
- If the convertible top is installed, operate with the forward hatch open and leave cabin door open.
- Operate all burning fuel appliances, such as charcoal, propane, LPG, CNG or alcohol cooking devices in areas where fresh air can circulate. Do not use such devices where there is no noticeable air movement, especially in the cabin, when anchored, moored or docked.
- Do not idle engine without moving boat for more than 15 minutes at a time.
- Inspect the exhaust system regularly. (See Section 8, Required Inspection, Service and Maintenance.

If CO poisoning is suspected, have the victim breath fresh air deeply. If breathing stops, resuscitate. A victim often revives, then relapses because organs are damaged by lack of oxygen. Seek immediate medical attention.

A. Carbon Monoxide Monitor

Your boat has a carbon monoxide (CO) monitor mounted inside the boat . The CO monitor is an electronic instrument that detects CO. When there is a buildup of CO, the monitor will alert the occupants by a flashing DANGER light and alarm. The CO monitor is wired through a breaker on the DC distribution panel.

It is extremely important that you become totally familiar with your CO monitor and its functions.

Read and understand the CO monitor information and operating instructions located in your Owner's Manual Packet.

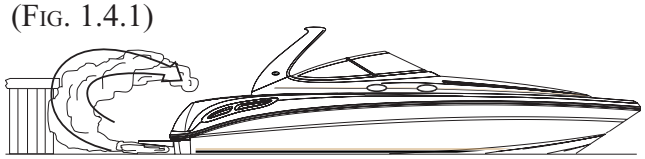
5. Lifesaving Equipment

Even strong swimmers can tire quickly in the water and drown due to exhaustion, hypothermia, or both. The buoyancy provided by a personal flotation device (PFD) will allow the person who has fallen overboard to remain afloat with far less effort and heat loss, extending survival time necessary to find and retrieve them.

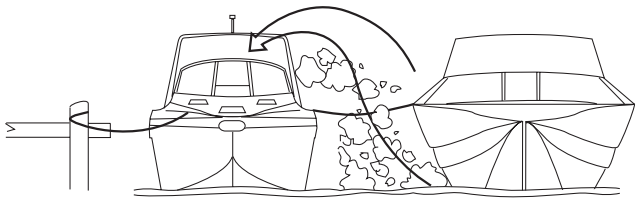
Boat operators are required to carry one wearable personal flotation device (Type I,II,III or V) for every person on board. Boats must also have at least one throwable device (Type IV).

The law requires that PFD's must be readily accessible, if not worn. "Readily accessible" means

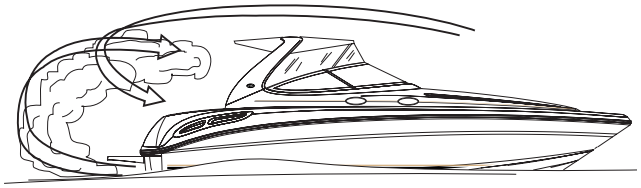
EXAMPLES OF HOW HIGH LEVELS OF CARBON MONOXIDE MAY ACCUMULATE (FIG. 1.4.1)



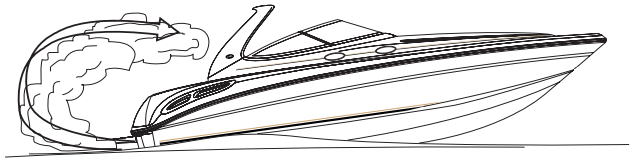
BLOCKING HULL EXHAUSTS. OPERATING AT SLOW SPEED OR DEAD IN THE WATER. ILLUSTRATION #A



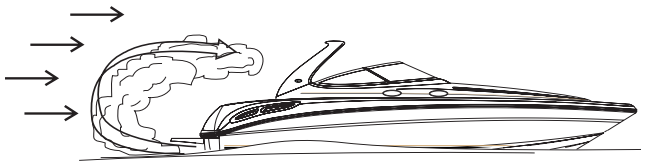
OPERATING ENGINE AND/OR GENERATOR IN CONFINED SPACES. ILLUSTRATION #D



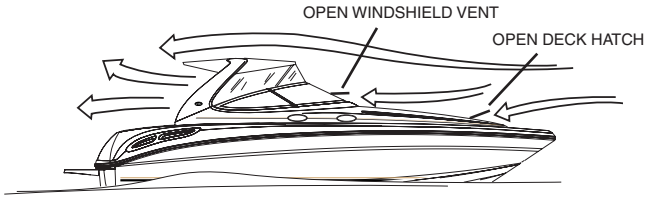
USING CANVAS CURTAINS. ILLUSTRATION #B



OPERATING WITH THE BOW HIGH. ILLUSTRATION #E



WINDS BLOWING EXHAUST TOWARD BOAT OCCUPANTS. ILLUSTRATION #C

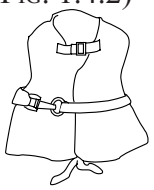


GOOD VENTILATION. ILLUSTRATION #F

removed from storage bags and unbuckled. But, children and nonswimmers must wear PFDs at all times when aboard. It is common sense to have everyone on board wearing PFDs. A throwable device must also be right at hand and ready to toss.

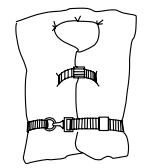
A. PFD CLASSIFICATIONS

(FIG. 1.4.2)



Off-Shore Life Jacket (Type I) – most buoyant, it is designed to turn an unconscious person face up; used in all types of waters where rescue may be slow, particularly in cold or rough conditions.

(FIG. 1.4.3)

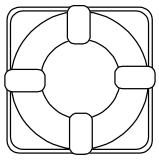


Near-Shore Life Vest (Type II) – "keyhole" vest with flotation-filled head and neck support is also designed to turn a person face up, but the turning action is not as pronounced; used in calm, inland waters or where quick rescue is likely.

(FIG. 1.4.4)

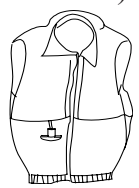
Flotation Aid (Type III) – vest is designed so conscious wearers can turn face up; often designed for comfort while engaged in sports such as skiing.

(FIG. 1.4.5)



Throwable Devices (Type IV) – horseshoe buoys, ring buoys and buoyant cushions are designed to be grasped, not worn.

(FIG. 1.4.6)



Special-Use Devices (Type V) – sailboat harnesses, white-water vests, float coats, and hybrid vests which have minimum inherent buoyancy and an inflatable chamber.

Before purchasing PFDs, ensure that there is an attached tag indicating they are approved by the U.S. Coast Guard or by your national boating law enforcement agency.

Children and nonswimmers must wear PFDs at all times when aboard. All passengers and crew should wear them. A loose PFD is often useless in an emergency.

The operator is responsible for instructing everyone aboard on the location and use of PFDs.

Size PFDs for the wearer. Children require special attention in the use of PFDs.

Test PFD buoyancy at least once a year.

6. Additional Recommended Equipment for Safe Operation

In addition to legally mandated equipment, the following items are necessary for safe boating, especially if your boat is out of sight of land.

- First aid kit
- Visual distress signals for day and night use (required in some areas; consult local regulations)
- Charts of your intended cruising area
- Compass
- GPS or Loran position locating devices
- Marine VHF radio with weather channels
- Emergency position-indicating radio beacon (EPIRB)
- Manual bilge pump
- Moisture repellant
- Anchors, chain and line (The anchors must be properly sized for your boat. Ask your dealer or marine supply store for recommendations).
- Mooring lines
- Fenders
- Boat hook
- Waterproof flashlight(s)
- Extra batteries for flashlights and portable electronic devices
- High power spotlight, if you intend to boat at night
- Spare keys
- Instruction manuals for engine and accessories
- Lubricating oil
- Tool kit:

  - Assorted screwdrivers (phillips and flat blade)

  - Pliers (regular, vise-grip, and tongue & groove)

  - Wrenches (box, open-end, allen, adjustable)

  - Socket set (metric or U.S. Standard as appropriate)

  - Electrical tape and duct tape

  - Hammer

  - Utility Knife
- Spare parts kit (spark plugs, fuses, hose clamps and ask your dealer to recommend other parts)
- Extra propeller

7. Impaired Operation

Drugs and/or alcohol will prevent you from operating your boat safely. This single factor is involved in more marine accidents and deaths than any other. The detrimental effects of alcohol and drugs are increased by the wind, waves and sun, quickly impairing your ability to react properly and promptly in an emergency.

⚠ WARNING

Drugs and/or alcohol impair the operator's ability to control the boat safely.

Death or serious injury can result from improper boat operation.

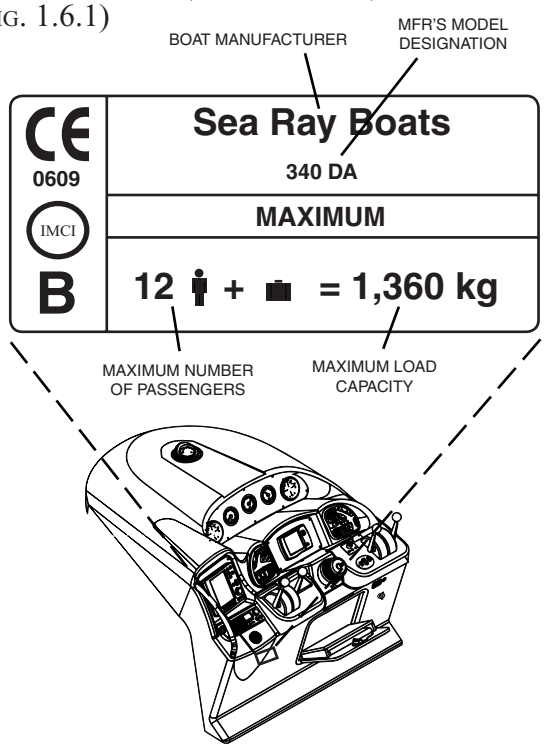
8. LOAD CAPACITY

The certification plate (See fig. 1.6.1) located near the helm indicates maximum weight and number of persons your boat can handle under calm sea conditions. **Do not exceed the load capacities stated.** The number of people on board must be reduced if you go out in poor weather and rough water.

The information present on the certification plate does not relieve the operator from responsibility. Use common sense and sound judgement when placing equipment and/or passengers in your boat.

- Do not load to capacity in poor weather or rough water.
- The number of seats does not indicate how many people a boat can carry in poor weather and rough water.
- Above idle speed, all passengers must be seated on the seats provided.

BUILDER'S PLATE (INTERNATIONAL)
(FIG. 1.6.1)



⚠ WARNING

When engine is running, keep passengers away from areas not designed for riding, such as seat backs, bow, gunwales, transom platform, swim platform, front and rear decks and on sun pads.

Passengers can fall overboard if not seated properly on the seats provided.

⚠ DANGER

Never carry more weight or passengers than indicated on the certification plate, regardless of weather or water conditions.

The boat can capsize, swamp or sink.

9. POWER CAPACITY

Do not exceed the maximum engine power rating of the largest engine option available for this vessel. Your boat will be difficult to handle and will be less stable.

10. PROPELLERS

Your Sea Ray® has been equipped with a propeller which our tests have shown to be the best suited for general use with our engine under normal conditions and load. Do not change the pitch of your propeller without getting your dealer's recommendations first. If you change to a different propeller pitch, **under no circumstances use a propeller which allows the engine to operate at higher than recommended RPM.** (your engine manual specifies the maximum recommended RPM).

To maintain rated power, propellers should be free of nicks, excessive pitting and any distortions that alter them from their original design. Badly damaged propellers should be replaced, but those that are chipped, bent or merely out of shape can be reconditioned by your marine dealer.

It is advisable to carry an extra propeller aboard in case you damage the one in use.

11. STABILITY

Your boat was manufactured to specific stability and flotation standards for the capacity shown on the certification plate. Any increase from the recommended load capacities will put your boat in jeopardy of capsizing, swamping and/or sinking.

IN ADDITION:

- Stability may be substantially reduced if equipment is added above the deck.
- Stability is substantially reduced by loose fluids or weight within the hull. Keep bilge area as dry as possible, and close all openings, hatches and windows in rough weather.

⚠ WARNING

Distribute passengers and gear as uniformly as possible from front to rear and left to right.

The manufacturer's load rating is the maximum allowed under calm conditions.

Reduce boat loading if weather, water or other conditions are adverse.

12. MAINTAIN CONTROL

On the water there are no marked traffic lanes, no traffic signs or lights, and boats have no turn signals. The boat operator must keep her or his attention focused not only on what's ahead but what's on the left, right and behind the boat.

The operator must always be alert to approaching boats (from the rear, right and left sides, as well as those ahead). There can be people in the water, partially submerged debris, and other navigational hazards such as rocks, sand bars, dangerous currents, to name a few.

Your passengers are relying on you to operate and maneuver the boat safely so that they are not in danger of going overboard. If you turn to quickly, increase or decrease speed abruptly, your passengers are at risk of being thrown overboard or thrown about the boat.

When visibility becomes impaired because of weather, time of day or high bow angle you must slow down so that you have sufficient time to react if an emergency occurs. Nearby boats face similar risks in avoiding a collision with you.

⚠ WARNING

Death or serious injury can result if you fail to observe these safety rules:

- **Anyone who controls the boat must have taken a boating safety course and have trained in the proper operation of the boat.**
- **Always operate the boat at speeds that will not put people or property in danger.**
- **Be constantly aware of conditions in all directions when underway and before turning.**
- **Reduce speed, use a lookout to identify possible hazards or difficulties, and turn on navigation lights when:**
  - **visibility is impaired;**
  - **in rough water; and**
  - **in congested waterways.**
- **Watch your wake. It can capsize a small boat or damage moored boats or other property. You are responsible for damage**

A. GENERAL CONSIDERATIONS

- Know how your boat handles under different conditions. Recognize your limitations and the boat's limitations. Modify speed in keeping with weather, sea and traffic conditions.

- Instruct passengers on location and use of safety equipment and procedures.
- Instruct passengers on the fundamentals of operating your boat in case you are unable to do so.
- You are responsible for passenger's actions. If they place themselves or the boat in danger, immediately correct them.

Observe the safety rules listed below.

13. WEATHER

There are four design categories of boats based upon their ability to withstand wind and sea or water conditions:

A. Ocean
Wind speed: above 40 knots (46 mph) Wave height: above 4 meters (13 feet) Boat may be used for extended ocean voyages.

B. Offshore
Maximum wind speed: 40 knots (46 mph)
Maximum wave height: 4 meters (13 feet)
Boat can be used offshore, but not for extended ocean voyages.

C. Inshore
Maximum wind speed: 27 knots (31 mph)
Maximum wave height: 2 meters (6.5 feet)
Boat use is limited to coastal waters, large bays, estuaries, lakes and rivers.

D. Sheltered waters
Maximum wind speed: 15 knots (18 mph)
Maximum wave height: 0.5 meters (1.5 feet)
Boat use is limited to small lakes, rivers and canals.

Your 340 Sundancer® is Design Category B.

The wind speed and wave height specified as the upper limit for your category of boat does **not** mean that you or your passengers can survive if your boat is exposed to these conditions. It is only the most experienced operators and crew that may be able to operate a boat safely under these conditions. You must always be aware of weather conditions and head for port or protected waters in sufficient time to avoid being caught in high winds and rough water. **Do not take chances!**

⚠ DANGER

DO NOT ATTEMPT TO BOAT IN
SEVERE WEATHER CONDITIONS

DEATH OR SERIOUS INJURY CAN OCCUR

GET TO SHORE BEFORE
THE WEATHER TURNS BAD

Getting caught in severe weather is hazardous. Bad weather and/or rough sea or water conditions can cause an unsafe situation. Consult local weather information, or listen to the NOAA weather reports for the latest weather conditions or any impending deterioration of the weather before setting out and while underway. Following are a few basic weather-related rules:

- Check the weather forecast and the water conditions before leaving and while underway.
- A sudden change in wind direction or speed or an increase in wave height indicates deteriorating weather.
- Have everyone wear a personal flotation device.
- If a storm approaches, immediately seek a safe harbor.
- If a storm hits, have everyone sit in the cabin or on the cockpit deck in the boat. Head the bow into the wind with enough power to maintain slow headway.
- If you encounter fog, determine your position, set a safe course, slow down and alert other boats of your presence with a sound signal.
- If a lightning storm approaches, the safest action is to dock and disembark. If you cannot return to shore, have passengers go **inside** the cabin and remain there until the storm passes.

- Lightning seeks a ground when it strikes. The best protection is a properly grounded lightning rod placed high enough over the deck to provide a protective umbrella over the hull. Depending upon the likelyhood of your being in a lightning storm, consult your dealer for installation of a lightning rod. Stay clear of the lightning rod, all attached wiring and all metal parts of the boat.
- Stay out of the water during a lightning storm. If caught swimming during a storm, get back into the boat and remain there until the storm passes.

14. CHART YOUR COURSE

⚠ WARNING

Hitting an object in or under the water or boating in dangerous currents can cause serious injury or death to boat occupants.

You must know where the hazards are and avoid them.

In uncharted waters, boat very slowly and post a lookout.

To avoid boating in unsafe areas where there are underwater obstructions, shallow water, unnavigable conditions such as dangerous currents, and others, **you must chart a course.** This means having and using the National Oceanic and Atmospheric Administration (NOAA) charts for coastal waters, observing and understanding all navigational aids, using the knowledge and guidance of experienced boaters, and being aware of the tide times where appropriate.

⚠ WARNING

Shut engine off if an object is struck or if you run aground.

Check for hull leaks and drive line damage, before restarting engines.

Use hand pump if bilge pumps don't remove water.

Boat very slowly, if you must proceed with a damaged drive line.

If you are in an unfamiliar area without knowledge of the hazards, proceed very slowly and have someone watch for hazards.

Let others know where you are going. A float plan describes your intended cruising course and itinerary, boat description, and your expected time and date of return. Give the float plan to a friend or relative, so they can give the information to a national boat agency, like the U.S. Coast Guard, in the event you fail to return.

15. WATER SPORTS

⚠ WARNING

Your boat can kill or injure persons in the water.

Always stay away from areas designated for swimming or diving. Unless you are towing a skier, stay away from water ski areas. Recognize markers used for such areas.

When engine is running, close and lock transom door and do not permit anyone to use boarding ladder and swim platform.

A. SWIMMING

- Do not permit anyone to swim from a moving boat, or a boat with an engine running.
- Many localities prohibit swimming from boats except in designated areas.
- Make sure boat's engines are turned off before allowing people to swim anywhere near your boat. Shut the engine OFF and remove the key from the ignition switch so that nobody will accidentally start the engine while swimmers are nearby.
- Turn off engines when taking swimmers or skiers aboard or when they are entering the water. Never permit use of the transom or swim platform while engines are running.
- Slow down and look for swimmers or skiers when cruising in an area where there might be persons in the water.

B. SKIING

⚠ WARNING

Skiers must wear an approved PFD.

It is advised that you become familiar with water skiing safety and hand signals as you will most likely, on occasion, find yourself in the vicinity of or engaging in water skiing activity.

- Anyone who water skis must know how to swim.
- Never drive the boat directly behind a water skier. At 22 knots (25 m.p.h.), it takes only 5 seconds to overtake a fallen skier who was 60 meters (200 feet) in front.
- Keep a downed skier in sight and on the operator's side of the boat when approaching the skier. Never back up to anyone in the water.
- Learn the signals to communicate with a skier. The skier is to control the boat through hand signals (Fig. 1.10.1).

  Turn – Arm raised, circle with index finger extended.

  Skier in Water – Extend one ski vertically out of water.

  Back to Dock – Pat top of head.

  Cut Motor – Draw finger across throat.

  Slow Down – Thumb pointed down or palm down, move hand up and down.

  Faster – Thumb pointed up or palm up, move hand up and down.

  OK – Raise arm and form a circle with thumb and index finger.

  Stop – Raise arm with palm vertical and facing forward.

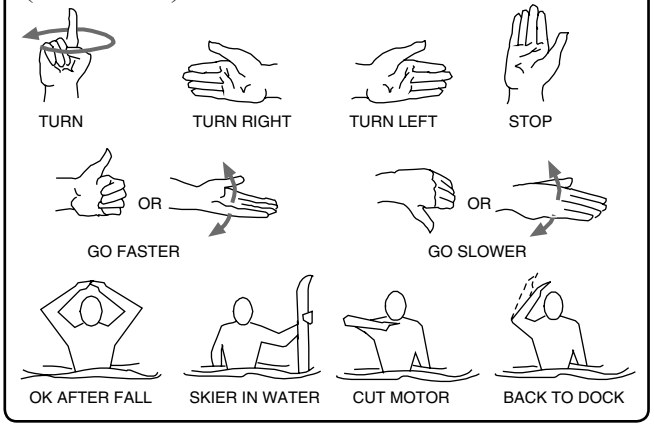
  Turn Right – Extend arm out from body to the right.

  Turn Left – Extend arm out from body to the left.

  OK After a Fall – Clasp hands together overhead.

- If the skier suddenly releases the tow rope, it can backlash into cockpit. Spotters who are watching the skier must be aware of this fact and be prepared to deflect the rope by hand to avoid injury.

SKIING SIGNALS
(FIG. 1.10.1)



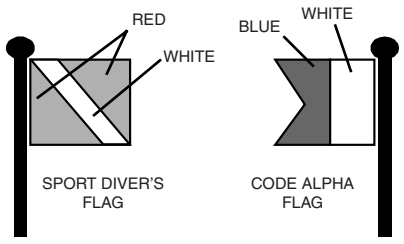
C. DIVING

- Recognize and respect diving flags (Fig. 1.10.2). Keep at least 30 meters (100 feet) away.

  Sport Divers Flag – Red flag with diagonal white stripe marks a diver in the water.

  Code Alpha Flag – Blue and white pennant designates boat being used in dive operations.

DIVERS FLAGS
(FIG. 1.10.2)



IN GENERAL

When engaged in water sports, be safe and courteous to others sharing the water:

- Be considerate to fishermen.
- Do not water ski in congested areas.
- Keep the boat and skier away from navigation markers.
- Stay well clear of other boats and skiers.

16. EMERGENCY SITUATIONS

Prevention is the safest approach. We hope that you are never involved in an emergency situation.

ASSISTING OTHER BOATERS

All boaters have a legal obligation to help other boaters who are in distress, as long as rendering assistance does not endanger you, your passengers or your boat.

If you are involved in an emergency situation, it is imperative that you know how to react, in order to protect the lives in your care.

A. MEDICAL EMERGENCY

You may be far from professional medical help when you are boating. At least two people on board your boat should be CPR certified, and should have taken a first aid course. Equip your boat with a first aid kit.

B. WATER RESCUE

A person who has fallen overboard will die from hypothermia in water temperatures below 70°F if not rescued quickly. Water rescue consists of three steps: returning to the victim, making contact with the victim, and getting the victim back on board.

RETURNING TO THE VICTIM

- Immediately make everyone aware of the incident and keep the victim in sight.
- Slow the boat and keep pointing toward the person overboard. At night, direct the best available light source at the person.
- Throw a life preserver, even if the person is wearing a PFD. It will serve as another marker.

MAKING CONTACT

- Stop or slow the boat and circle toward the victim.
- Try to approach heading into the wind or into the waves.
- Keep the victim constantly in sight.
- When almost alongside, stop the engine in gear to prevent propeller “windmilling.”

GETTING BACK ABOARD

- Try to reach the victim with a pole, or by throwing a life preserver. Do not swim to rescue the victim, except as a last resort.
- Assist the person in boarding the boat. The person should normally be brought in over the stern.
- If the person is injured or cannot get into the boat, a rescuer should put on a PFD with a safety line attached to the boat and enter the water to assist the victim.
- Handle the victim with care. Spinal injuries may have occurred.

C. FIRE

Fire is a serious boating hazard. Boats will burn quickly. Do not remain on board and fight a fire for more than a few minutes. If the fire cannot be extinguished within a few minutes, abandon the boat.

Have fire extinguishers handy. A small fire can be extinguished quickly with the right size and type of fire extinguisher.

- Extinguish smoking materials, shut off blowers, stoves, engines and generators.
- Throw burning materials overboard, if possible.
- If the fire is accessible, empty the contents of fire extinguishers at the base of the fire.
- If the fire is in the engine compartment and you have an automatic extinguisher for the engine, wait 15 minutes before opening the compartment. Have a portable extinguisher ready in case the fire flares up.
- Signal for help.
- Grab distress signals and survival gear. Put on PFDs. Prepare to abandon ship.

D. Flooding, Swamping and Capsizing

In the event of flooding, swamping or capsizing:

- Try to shut off engines, generators and blowers, before leaving the boat.
- Have everyone put on Personal Flotation Devices (PFD's).
- Account for all who were on board.
- If the boat is floating stay with the boat. Hang on, or climb on the boat and signal for help.
- Only as a last resort should you attempt to swim to shore - it is further away than it looks and you can tire and drown.

E. Collisions and Leaking

In the event of collision and leaking:

- Slow down or stop to reduce water intake, unless maintaining speed will keep the hole above water.
- Switch on bilge pumps.
- If equipped, operate the manual bilge pump if the powered bilge pumps can't handle the water flow.
- Account for everyone on board and check for injurys.
- Have everyone put on PFDs.
- Stay with the boat.
- Signal for help.
- If a leak patch is attempted, it should be done from the outside.
- In the event of a collision, you are required to file an accident report. Contact a state enforcement agency or the nearest Coast Guard office. If you are boating outside of U.S. waters, consult the nation you are visiting for accident reporting requirements.

F. Grounding

In the event of running aground:

- Check for leaks. If water is coming in, stop the intake of water before attempting to get the boat free.
- Inspect for damage to the hull, propulsion and steering systems.
- Determine if the tide, wind and current will drive the boat harder aground or will help to free it.
- Determine the water depth all around the boat, and the type of bottom (sand, mud, rocks, etc.). If it can be done without exposing persons to risk of injury, the boat should be moved away from hard obstructions and toward open water with soft ground.
- Do not attempt to have your boat towed by other than a trained and competent service, such as the Coast Guard or a salvage company. Recreational craft are not designed to tow other recreational craft.

G. Propulsion, Control or Steering Failure

If the drive train fails, or controls or steering do not respond properly at all:

- Shut off engine.
- Put out the anchor to prevent drifting.
- Determine whether or not you can repair the problem yourself. See the proper manuals for assistance in troubleshooting the engine, steering and engine controls.
- If you are not sure you can fix the problem, or if conditions are adverse, signal for help.

17. Safety Hotlines

The safety information in the preceeding pages gives only the general areas of concern for boating safety. It is not intended to be, nor can it be, exhaustive. You must take a boating safety course, and get hands-on instruction in the proper and safe operation of your boat from experienced persons before cruising.

The U.S Coast Guard offers many pamphlets on safety and other information not covered in this book. Contact your local Coast Guard unit or call the toll-free safety hotlines below for information.

- U.S. Coast Guard 1-800-368-5647
- Canadian Coast Guard 1-800-267-6687

In other countries, ask your marine dealer for information on how to contact the national boating law enforcement agency.

18. International Requirements

This vessel and its systems have been constructed in accordance with standards and specifications in effect at the time of manufacture as published by the various regulatory authorities listed below.

1. Ministere De La Mer - France
2. Registro Italiano Navale - Italy
3. Det Norske Veritas - Norway
4. Securite des Nauires - Canada
5. J.C.I. (Japan Craft Inspection) - Japan
6. N.K.K. (Nippon Kaiji Kyokai) - Japan
7. B.S.I. (British Standards Institute) - England
8. Ministerio Obras Publicas Y Transportes - Spain
9. EC Recreational Craft Directive - European Community.

Further information concerning these requirements may be obtained from Sea Ray® Customer Service: 1-800-SRBOATS.

19. NAUTICAL TERMS

Abeam – object 90 degrees to center line on either side of boat.

Abaft – a point on a boat that is aft of another.

Aft – toward the rear or stern of the boat.

Beam – the width of a boat.

Bow – the fore part of a boat.

Bow Eye – bolt with looped head mounted on extreme forward part of bow.

Bulkhead – vertical partition in a boat.

Chine – meeting juncture of side and bottom of boat.

Chock – deck fitting, used as guides for mooring or anchor lines. Also, a wedge to stop wheels from rolling.

Cleat – deck fitting with arms or horns on which lines may be made fast.

Cockpit – an open space from which a boat is operated.

Deck – upper structure which covers the hull between gunwales.

Draft – depth of water required to float boat and its propulsion system.

Fathom – six feet.

Fenders – rope or plastic pieces hung over the side to protect the hull from chafing.

Freeboard – height of exposed hull from water line to deck.

Ground tackle – general term referring to anchors, anchor lines, etc.

Gunwale (pronounced gun'l) – meeting juncture of hull and deck.

Hatch – an opening in deck to provide access below.

Head – toilet or toilet area in a boat.

Headroom – vertical distance between the deck and cabin or canopy top.

Helm – steering console.

Hull – the basic part of a boat that provides buoyancy to float the weight of the craft and its load.

Keel – the major longitudinal member of a hull; the lowest external portion of a boat.

Knot – unit of speed in nautical miles per hour.

Lee – the side that is sheltered from the wind.

PFD – Personal Flotation Device; life preserver.

Port – term designating left side of the boat.

Rudder – movable fixture at the stern used for steering.

Scupper – hole permitting water to drain overboard from deck or cockpit.

Sheer – curve or sweep of the deck as viewed from the side.

Snub – to check or tighten a line suddenly.

Starboard – term designating right side of the boat

Stern – the aft end of a boat.

Stern drive – outboard unit of an inboard/outboard (I/O) engine installation.

Stringer – longitudinal members fastened inside the hull for additional structural strength.

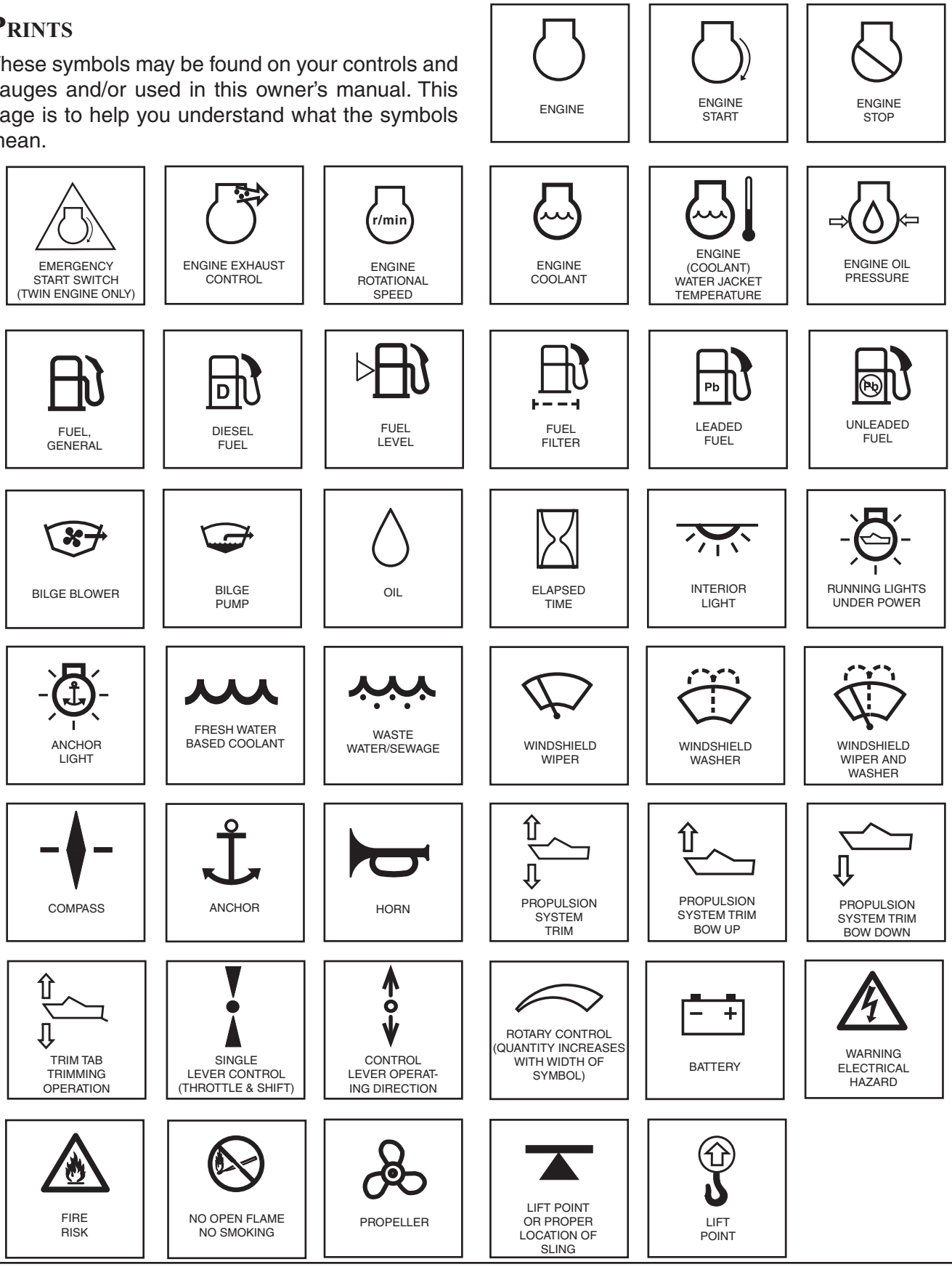
Transom – transverse part of stern.

Wake – disturbed water that a boat leaves behind as a result of forward motion.

Windward – toward the direction from which the wind is blowing.

20. KEY TO SYMBOLS ON CONTROLS & PRINTS

These symbols may be found on your controls and gauges and/or used in this owner's manual. This page is to help you understand what the symbols mean.



21. ENVIRONMENTAL CONSIDERATIONS

The following warning is offered for boats sold in the State of California in accordance with California Health & Safety Code §§ 25249.5-.13:

⚠ WARNING

A wide variety of components used on this vessel contain or emit chemicals known to the State of California to cause cancer and birth defects and other reproductive harm.

EXAMPLES INCLUDE:

- **Engine and generator exhaust**
- **Engine and generator fuel, and other liquids such as coolants and oil, especially used motor oil**
- **Cooking fuels**
- **Cleaners, paints, and substances used for vessel repair**
- **Waste materials that result from wear of vessel components**
- **Lead from battery terminals and from other sources such as ballast or fishing sinkers**

TO AVOID HARM:

- **Keep away from engine, generator, and cooking fuel exhaust fumes.**
- **Wash areas thoroughly with soap and water after handling the substances above.**

A. FUEL & OIL SPILLAGE

Regulations prohibit discharging fuel or oily waste in navigable waters. Discharge is defined as any action which causes a film, sheen or discoloration on the water surface, or causes a sludge or emulsion beneath the water surface. A common violation is bilge discharge. Use rags or sponges to soak up fuel or oily waste, then dispose of it properly ashore. If there is much fuel or oil in the bilge, contact a knowledgeable marine service to remove it. Never pump contaminated bilge overboard. Help protect your waters.

Fill tank(s) less than rated capacity. Allow for fuel expansion.

B. WASTE DISPOSAL

- Many areas prohibit overboard sewer discharge. Close and disable flow-through waste systems to prevent discharge in such areas.
- Bag all refuse until it can be disposed of ashore. Regulations prohibit disposal of plastic anywhere in the marine environment and restrict other garbage disposal within specified distances from shore.

NOTICE

- **There is a possibility of being fined for having an operable direct overboard discharge of waste in some waters. Removing seacock handle, in closed position, or other means must be used to avoid fine.**
- **It is illegal for any vessel to dump plastic trash anywhere in the ocean or navigable waters of the United States.**

The Coast Guard is requiring any ocean-going boats 40 feet or larger to have a written "waste management" plan on board. While the requirement is aimed at commercial and passenger ships, there is no exception for recreational boats. "Ocean-going" means any boat going beyond the three-mile coastal U.S. boundary. The written plan can be as simple as:

> All vessel refuse is placed in trash bags which are stored on board until they can be disposed of in dumpsters on shore. This policy is reviewed by all crew and passengers. The person in charge of carrying out the plan is:
>
> Name:_____

⚠ CAUTION

FOR BOATS WITH VACUFLUSH® HEADS ONLY

Do not place facial tissues, paper towels or sanitary napkins in head. Such material can damage the waste disposal system and the environment.

C. EXCESSIVE NOISE

Many areas regulate noise limits. Even if there are no laws, courtesy demands that boats operate quietly.

D. WAKE / WASH

⚠ WARNING

SPEED HAZARD - Watch your wake. It might capsize a small craft. You are responsible for damage caused by your wake.

Power boat wakes can endanger people and vessels. Each power boat operator is responsible for injury or damage caused by the boat's wake. Be especially careful in confined areas such as channels or marinas. Observe "no wake" warnings.

⚠ CAUTION

Reduce speed in congested waterway.

Be alert for No Wake markers.

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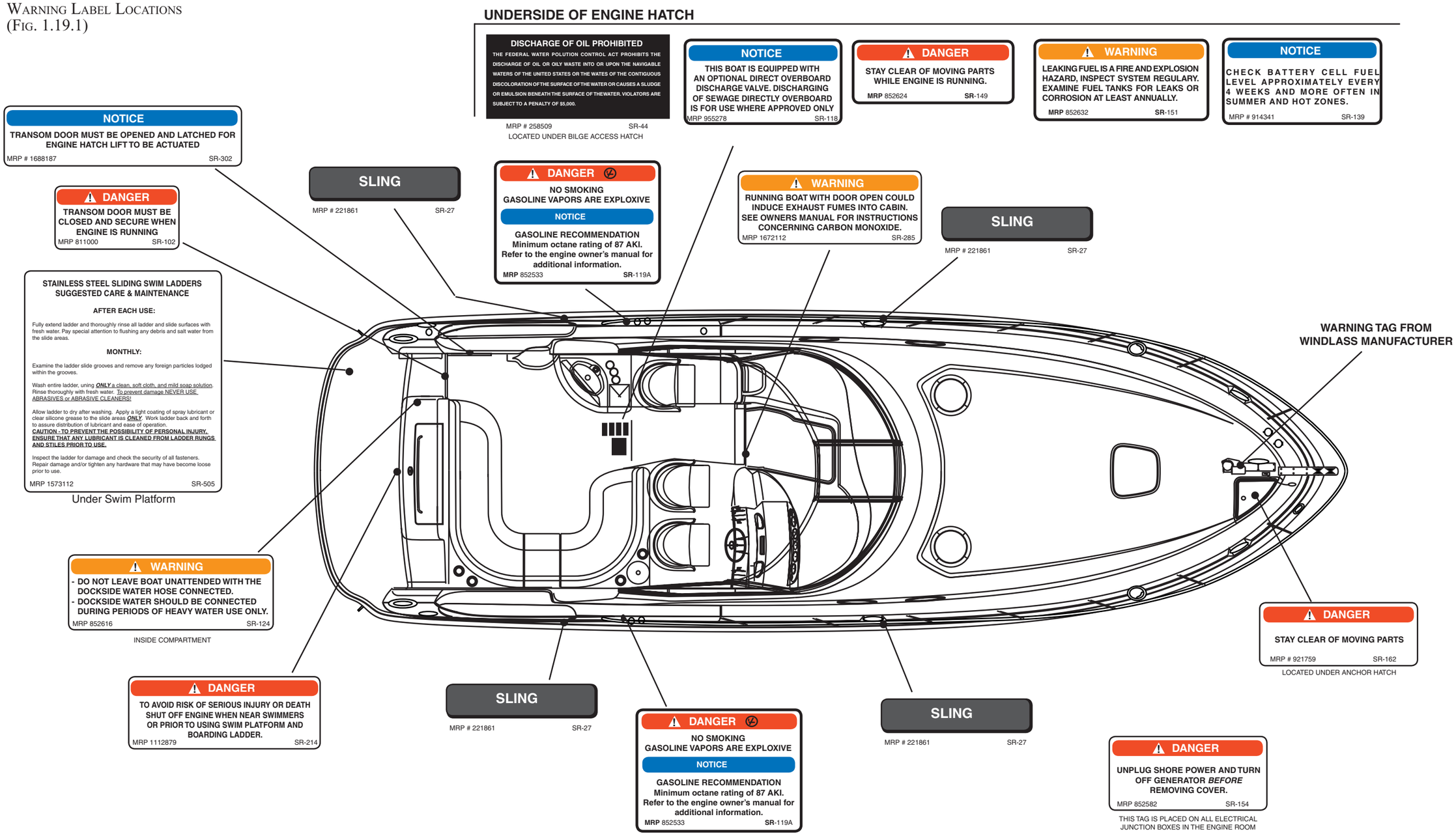
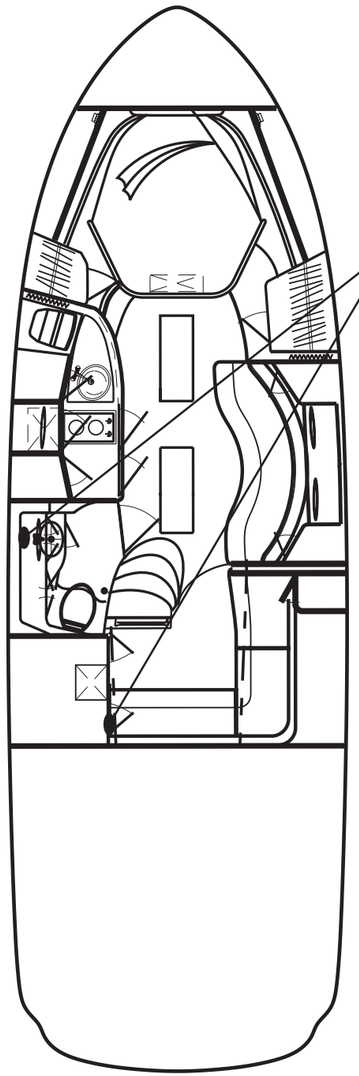
22. Warning Label Locations

Warning Label Locations (Fig. 1.19.1)


UNDERSIDE OF ENGINE HATCH
DISCHARGE OF OIL PROHIBITED
THE FEDERAL WATER POLUTION CONTROL ACT PROHIBITS THE DISCHARGE OF OIL OR OILY WASTE INTO OR UPON THE NAVIGABLE WATERS OF THE UNITED STATES OR THE WATES OF THE CONTIGUOUS DISCOLORATION OF THE SURFACE OF THE WATER OR CAUSES A SLUDGE OR EMULSION BENEATH THE SURFACE OF THE WATER. VIOLATORS ARE SUBJECT TO A PENALTY OF $5,000.
MRP # 258509 SR-44
LOCATED UNDER BILGE ACCESS HATCH
NOTICE
THIS BOAT IS EQUIPPED WITH AN OPTIONAL DIRECT OVERBOARD DISCHARGE VALVE. DISCHARGING OF SEWAGE DIRECTLY OVERBOARD IS FOR USE WHERE APPROVED ONLY
MRP 955278 SR-118
DANGER
STAY CLEAR OF MOVING PARTS WHILE ENGINE IS RUNNING.
MRP 852624 SR-149
WARNING
LEAKING FUEL IS A FIRE AND EXPLOSION HAZARD, INSPECT SYSTEM REGULARY. EXAMINE FUEL TANKS FOR LEAKS OR CORROSION AT LEAST ANNUALLY.
MRP 852632 SR-151
NOTICE
CHECK BATTERY CELL FUEL LEVEL APPROXIMATELY EVERY 4 WEEKS AND MORE OFTEN IN SUMMER AND HOT ZONES.
MRP # 914341 SR-139
NOTICE
TRANSOM DOOR MUST BE OPENED AND LATCHED FOR ENGINE HATCH LIFT TO BE ACTUATED
MRP # 1688187 SR-302
DANGER
TRANSOM DOOR MUST BE CLOSED AND SECURE WHEN ENGINE IS RUNNING
MRP 811000 SR-102
SLING
MRP # 221861 SR-27
DANGER
NO SMOKING
GASOLINE VAPORS ARE EXPLOXIVE
NOTICE
GASOLINE RECOMMENDATION
Minimum octane rating of 87 AKI.
Refer to the engine owner's manual for additional information.
MRP 852533 SR-119A
WARNING
RUNNING BOAT WITH DOOR OPEN COULD INDUCE EXHAUST FUMES INTO CABIN.
SEE OWNERS MANUAL FOR INSTRUCTIONS CONCERNING CARBON MONOXIDE.
MRP 1672112 SR-285
SLING
MRP # 221861 SR-27
WARNING TAG FROM WINDLASS MANUFACTURER
STAINLESS STEEL SLIDING SWIM LADDERS
SUGGESTED CARE & MAINTENANCE
AFTER EACH USE:
Fully extend ladder and thoroughly rinse all ladder and slide surfaces with fresh water. Pay special attention to flushing any debris and salt water from the slide areas.
MONTHLY:
Examine the ladder slide grooves and remove any foreign particles lodged within the grooves.
Wash entire ladder, uning ONLY a clean, soft cloth, and mild soap solution. Rinse thoroughly with fresh water. To prevent damage NEVER USE ABRASIVES or ABRASIVE CLEANERS!
Allow ladder to dry after washing. Apply a light coating of spray lubricant or clear silicone grease to the slide areas ONLY. Work ladder back and forth to assure distribution of lubricant and ease of operation.
CAUTION - TO PREVENT THE POSSIBILITY OF PERSONAL INJURY, ENSURE THAT ANY LUBRICANT IS CLEANED FROM LADDER RUNGS AND STILES PRIOR TO USE.
Inspect the ladder for damage and check the security of all fasteners. Repair damage and/or tighten any hardware that may have become loose prior to use.
MRP 1573112 SR-505
Under Swim Platform
WARNING
- DO NOT LEAVE BOAT UNATTENDED WITH THE DOCKSIDE WATER HOSE CONNECTED.
- DOCKSIDE WATER SHOULD BE CONNECTED DURING PERIODS OF HEAVY WATER USE ONLY.
MRP 852616 SR-124
INSIDE COMPARTMENT
DANGER
TO AVOID RISK OF SERIOUS INJURY OR DEATH SHUT OFF ENGINE WHEN NEAR SWIMMERS OR PRIOR TO USING SWIM PLATFORM AND BOARDING LADDER.
MRP 1112879 SR-214
SLING
MRP # 221861 SR-27
DANGER
NO SMOKING
GASOLINE VAPORS ARE EXPLOXIVE
NOTICE
GASOLINE RECOMMENDATION
Minimum octane rating of 87 AKI.
Refer to the engine owner's manual for additional information.
MRP 852533 SR-119A
SLING
MRP # 221861 SR-27
DANGER
STAY CLEAR OF MOVING PARTS
MRP # 921759 SR-162
LOCATED UNDER ANCHOR HATCH
DANGER
UNPLUG SHORE POWER AND TURN OFF GENERATOR BEFORE REMOVING COVER.
MRP 852582 SR-154
THIS TAG IS PLACED ON ALL ELECTRICAL JUNCTION BOXES IN THE ENGINE ROOM

Warning Label Locations (Continued)

Warning Label Locations
(Fig. 1.20.1)

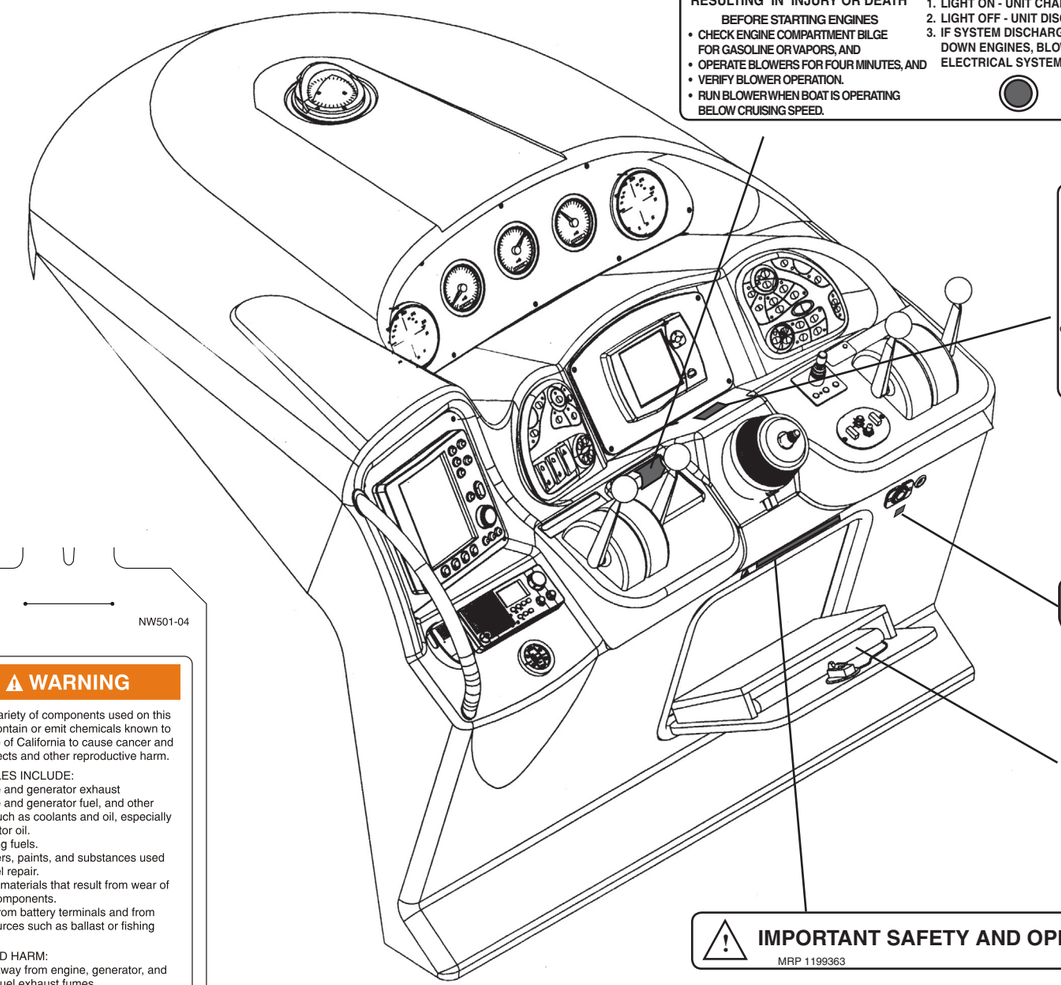


DANGER

LEAVING WINDOW OPEN COULD INDUCE EXHAUST FUMES INTO CABIN RESULTING IN SEVERE PERSONAL INJURY OR DEATH

MRP 852566 SR-135

Warning Label Locations
(Fig. 1.20.2)



WARNING

GASOLINE VAPORS CAN EXPLODE RESULTING IN INJURY OR DEATH

BEFORE STARTING ENGINES

- CHECK ENGINE COMPARTMENT BILGE FOR GASOLINE OR VAPORS, AND
- OPERATE BLOWERS FOR FOUR MINUTES, AND
- VERIFY BLOWER OPERATION.
- RUN BLOWER WHEN BOAT IS OPERATING BELOW CRUISING SPEED.

AUTOMATIC EXTINGUISHING SYSTEM

WITH IGNITION ON

1. LIGHT ON - UNIT CHARGED
2. LIGHT OFF - UNIT DISCHARGED
3. IF SYSTEM DISCHARGES, SHUT DOWN ENGINES, BLOWERS, AND ELECTRICAL SYSTEMS

MRP # 1658475 SR-281

DANGER

AVOID SERIOUS INJURY OR DEATH FROM CARBON MONOXIDE

EXHAUST FUMES FROM ENGINES CONTAIN CARBON MONOXIDE GAS AND MAY COLLECT IN ENCLOSED AREAS

KEEP COCKPIT CABIN AND CABIN AREAS WELL VENTILATED. DO NOT USE CANVAS, SIDE CURTAINS AND FORWARD VISOR WITHOUT PROPER VENTILATION.

CO SIDKNESS SYMPTIONS INCLUDE HEADACHE, NAUSEA, AND DIZZINESS. DO NOT MISTAKE FOR SEASICKNESS.

SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION

MRP 1369743 SR-246

12VDC-15A MAX

MRP # 324756 SR-47

SAFETY & OPERATIONAL INFORMATION BOOKLET (BACKSIDE OF DOOR)

IMPORTANT SAFETY AND OPERATIONAL INFORMATION

MRP 1199363 SR-218

NW501-04

WARNING

A wide variety of components used on this vessel contain or emit chemicals known to the State of California to cause cancer and birth defects and other reproductive harm.

EXAMPLES INCLUDE:

- Engine and generator exhaust
- Engine and generator fuel, and other liquids such as coolants and oil, especially used motor oil.
- Cooking fuels.
- Cleaners, paints, and substances used for vessel repair.
- Waste materials that result from wear of vessel components.
- Lead from battery terminals and from other sources such as ballast or fishing sinkers.

TO AVOID HARM:

- Keep away from engine, generator, and cooking fuel exhaust fumes.
- Wash areas thoroughly with soap and water after handling the substances above.

California Health & Safety Code §§ 25249.5-.13

MRP 1798084
CALIFORNIA RESIDENTS ONLY
THE ABOVE WARNING IS ATTACHED TO THE STEERING WHEEL PRIOR TO DELIVERY OF ANY BOATS SOLD IN THE STATE OF CALIFORNIA IN ACCORDANCE WITH CALIFORNIA HEALTH & SAFETY CODE §§ 25249.5-.13:

NMMA CERTIFIED

YACHT CERTIFICATION

DESIGN COMPLIANCE WITH NMMA REQUIREMENTS IN EFFECT ON THE DATE OF CERTIFICATION IS VERIFIED. MANUFACTURER RESPONSIBLE FOR PRODUCTION CONTROL

NATIONAL MARINE MANUFACTURERS ASSOCIATION

THIS BOAT COMPLIES WITH U.S. COAST GUARD SAFETY STANDARDS IN EFFECT ON THE DATE OF CERTIFICATION

SEA RAY BOATS, INC. MERRITT ISLAND, FL

NMMA CERTIFICATION TAG

CE
0609
IMCI
B

Sea Ray Boats

340 DA

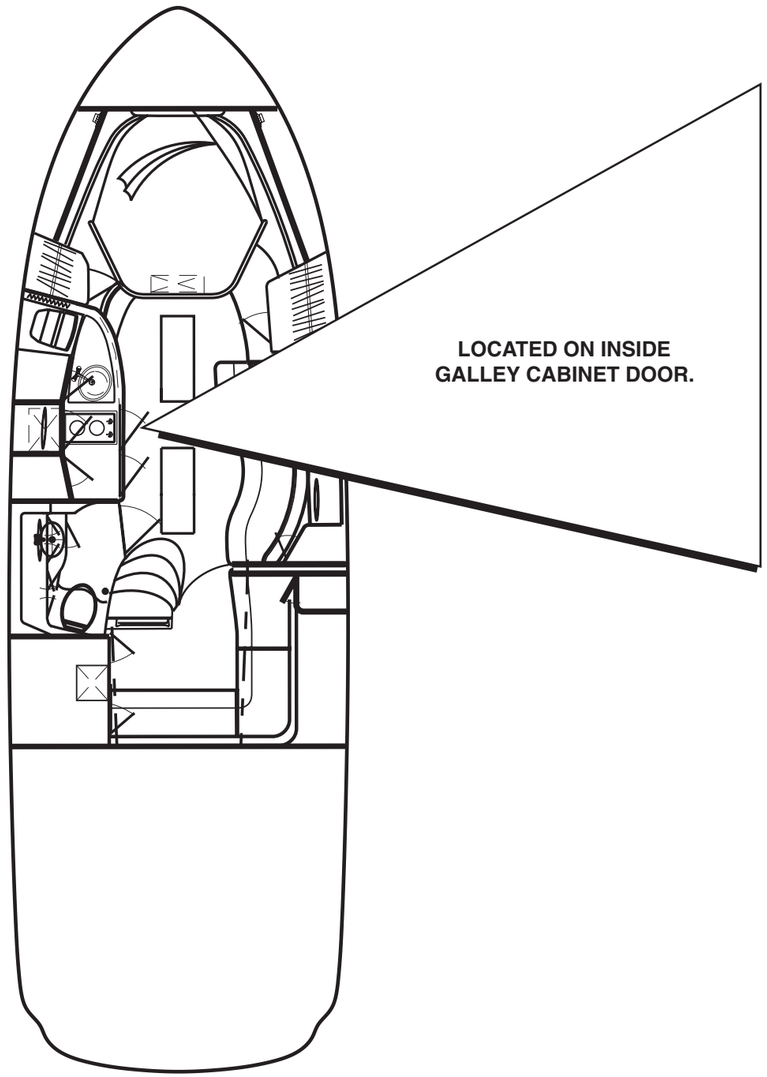
MAXIMUM

12 + = 1,360 kg

THIS TAG INSTALLED WHEN BOAT IS ORDERED WITH CE INTERNATIONAL OPTION

Warning Label Locations (Continued)

WARNING LABEL LOCATIONS
(FIG. 1.21.1)



LOCATED ON INSIDE GALLEY CABINET DOOR.

Save Our Seas

It is *illegal* to dump plastic trash anywhere into the ocean or navigable waters of the United States. Violation of these requirements may result in civil penalty up to $25,000, a fine of $50,000 and imprisonment for up to five years.

PLASTIC - Includes but is not limited to: plastic bags, styrofoam cups and lids, sixpack holders, stirrers, straws, milk jugs, egg cartons, synthetic fishing nets, ropes, lines, and bio or photo degradable plastics.

GARBAGE - Means paper, rags, glass, metal, crockery (generated in living spaces aboard the vessel-what we normally call trash), and all kinds of food, maintenance and cargo-associated waste.
"Garbage" does not include fresh fish or fish parts, dishwater, and gray water.

INSIDE 3 MILES

(and in U.S. Lakes, Rivers, Bays and Sounds)
PLASTICS
DUNNAGE, LINING AND PACKING MATERIALS THAT FLOAT
ANY GARBAGE EXCEPT DISHWATER/ GRAYWATER/FRESH FISH PARTS

3 TO 12 MILES

PLASTICS
DUNNAGE, LINNING AND PACKING MATERIALS THAT FLOAT
ANY GARBAGE NOT GROUND TO LESS THAN ONE SQUARE INCH

12 TO 25 MILES

PLASTICS
DUNNAGE, LINING AND PACKING MATERIALS THAT FLOAT

12 TO 25 MILES

PLASTICS

DUNNAGE- Material used to block and brace cargo, and is considered a cargo associated waste.

DISHWATER- Means the liquid residue from the manual or automatic washing of dishes and cooking utensils which, have been pre-cleaned to the extent that any food particles adhering to them would not normally interfere with the operation of automatic dishwashers.

GRAYWATER - Means drainage from a dishwasher, shower, laundry, bath, and washbasin, and does not include drainage from toilets, urinals, hospitals, and cargo spaces.

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1. DOCKING/LIFTING/STORAGE

⚠ CAUTION

Do Not use cleats for lifting.

BOW AND STERN CLEATS: (See Figure 2.1.1) Cleats must not be used for lifting the boat, they are intended for docking or mooring use only.

When lifting the boat always keep the bow higher than the stern to drain the exhaust lines and to prevent water from running forward through the manifold and into the engine where it can become trapped. It may seem expedient to lift only the stern when changing a propeller, but this can result in water entering the engine cylinders, causing hydrostatic lock and resulting in possible engine failure. Even a small amount of water in the engine can cause rust and is to be avoided.

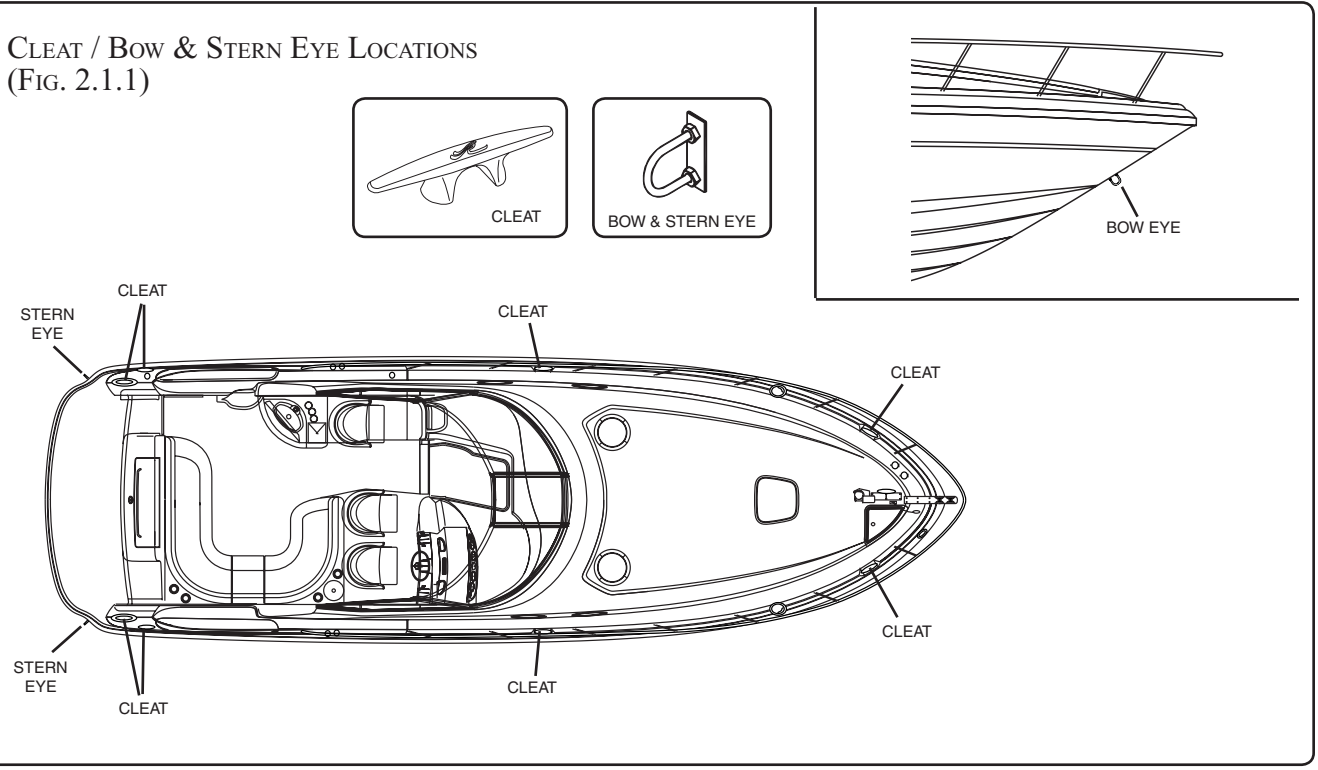
With fiberglass boats, severe gelcoat crazing or more serious hull damage can occur during launching and hauling if pressure is created on the gunwales by the slings. Flat, wide belting-type slings and spreaders long enough to keep pressure from the gunwales are necessary. Cable-type slings should be avoided. Do not place the slings where they may lift on the propeller shaft or other underwater fittings. The slings should be placed directly over the sling tags imprinted on the deck (See Figure 2.2.1) to assure the least amount of stress on the hull.

Never hoist the boat with an appreciable amount of water in the bilge. Fuel and water tanks should preferably be empty, especially if of large capacity.

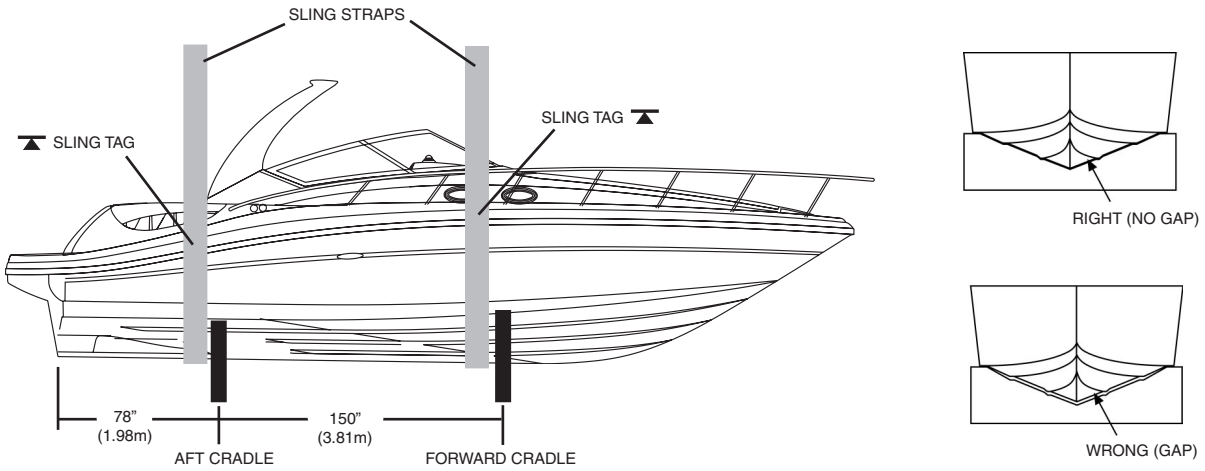
A. SUPPORTING THE BOAT

A cradle is the ideal support for the boat whenever it is not in the water. Properly designed and constructed, it will provide support at the proper points, which is essential to avoid stress on the hull. Boat placement on the cradle should line up as closely as possible to the sling tags on the side of the deck. Do not rest boat on underwater fittings.

CLEAT / BOW & STERN EYE LOCATIONS
(FIG. 2.1.1)



PROPER LIFTING AND STORAGE
(FIG. 2.2.1)



2. PASSENGER LOCATIONS

⚠ WARNING

Boat motion can be erratic.

You can fall overboard or be injured by hitting something in or on the boat.

All persons must be in cockpit area or cabin and be prepared for sudden boat movement.

Use front or bow deck area only during anchoring, mooring or emergencies.

⚠ WARNING

Wet decks are slippery.

You can be seriously injured if you slip and fall.

Wear slip resistant footwear secured to your feet and hold on to rails or boat structure.

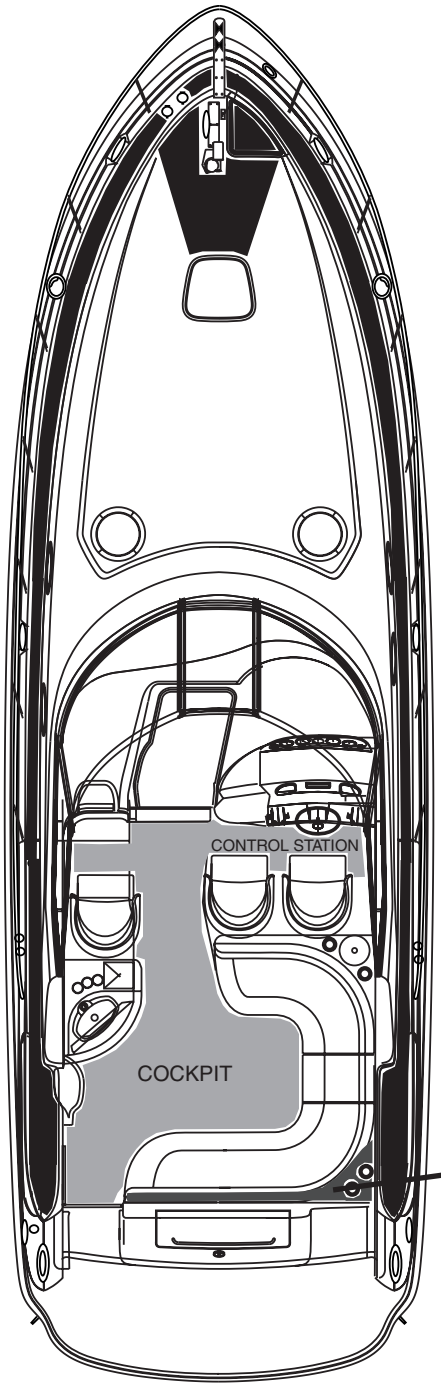
1. When the boat is moving, all passengers must be in the cockpit area or in the cabin and must be on seating provided or, if standing, holding on firmly (See Figure 2.3.1).

   While the person at the wheel must alert passengers before any sudden or erratic boat movement, such as crossing wakes, rapid turns, sudden acceleration or deceleration, etc., an emergency action may be necessary before passengers can be warned. All passengers must be prepared for rapid boat movement and be able to hold on to prevent loss of balance.

2. When persons are on the working deck area, for anchoring, mooring or in emergencies, they must be holding on and be positioned so as to prevent falling. In bad weather and/or rough water, if it is essential to be on deck, persons should be closely tied to cleats, railing stanchions or other securely fastened boat hardware.

3. Engines must be turned off if the boat is near swimmers or persons are on the swim platform or the swim ladder.

PASSENGER LOCATIONS
(FIG. 2.3.1)



WORKING DECK
(DECK AREA INTENDED FOR OCCUPATION DURING ANCHORING, MOORING AND EMERGENCY OPERATION ONLY)

ACCOMODATION DECK
(DECK AREA INTENDED FOR OCCUPATION DURING NORMAL OPERATION)

DO NOT WALK ON THIS AREA

⚠ WARNING

Wet decks are slippery.

You can be seriously injured if you slip and fall.

Wear slip resistant footwear secured to your feet and hold on to rails or boat structure.

⚠ DANGER

Rotating propellers can injure or kill you.

Shut off engine when persons are in water, near boat, on swim platform or ladder.

⚠ WARNING

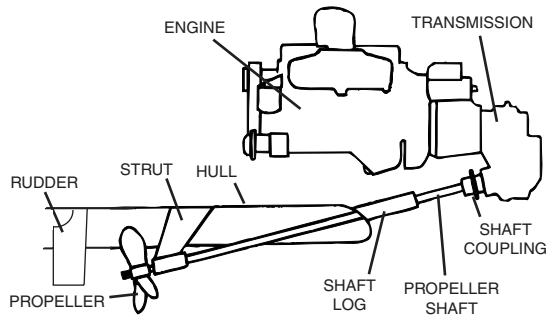
You can be seriously injured if you stand or walk here.

3. STANDARD PROPULSION SYSTEM

The standard engine is an inboard V-drive type propulsion system. This system incorporates an inboard engine with an angled transmission that allows the drive shaft to pass through the hull under the engine.

REFER TO THE ENGINE OWNER'S MANUAL FOR OPERATING INSTRUCTIONS AND WARRANTY INFORMATION.

INBOARD V-DRIVE ENGINE (FIG. 2.4.1)

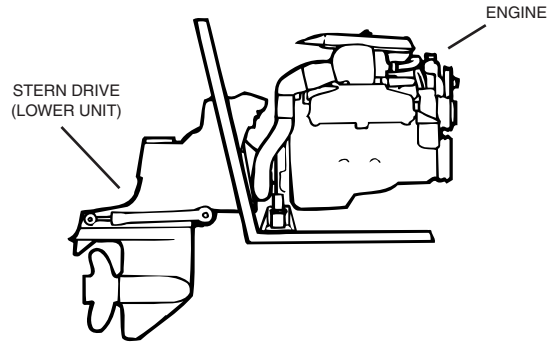


4. OPTIONAL PROPULSION SYSTEM

The optional engine on your boat is a stern drive propulsion system also known as an inboard-outboard engine. This type of propulsion system has the engine inside the boat secured to the hull's stringers at the rear end of the hull. The stern drive unit, also called the lower unit because it hangs below the hull, is part of the propulsion system that attaches to the outside of the hull or transom. The stern drive unit pivots to steer the boat.

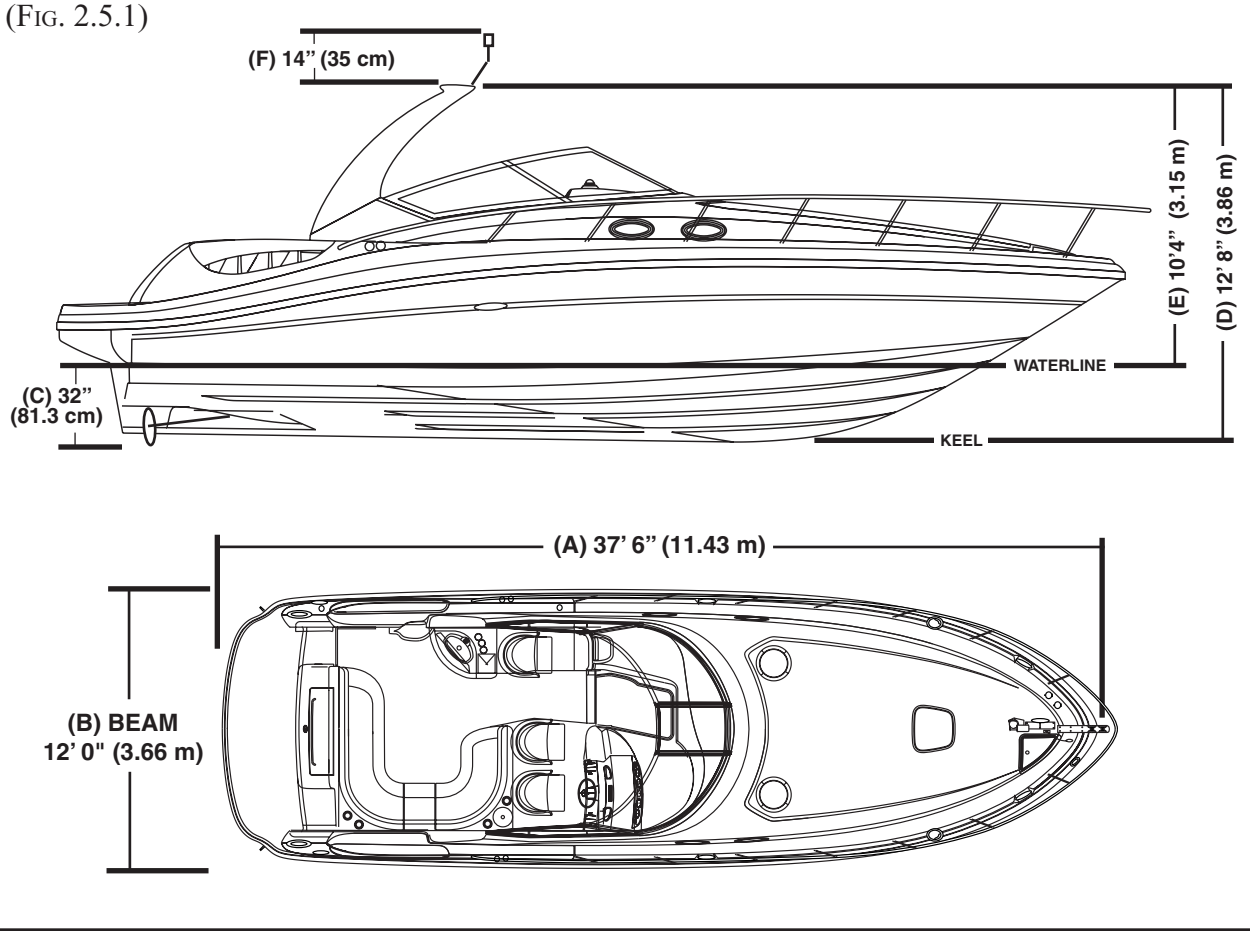
REFER TO THE ENGINE OWNER'S MANUAL FOR OPERATING INSTRUCTIONS AND WARRANTY INFORMATION.

STANDARD STERN DRIVE (INBOARD-OUTBOARD) ENGINE (FIG. 2.4.2)



5. BASIC BOAT DIMENSIONS AND CLEARANCES

BOAT DIMENSIONS AND CLEARANCES
(FIG. 2.5.1)



340 SUNDANCER SPECIFICATIONS

(A) Overall Length With Std. Swim Platform	**37ft. 6in.**	**11.43 m**
(B) Beam (Width)	**12ft. 0in.**	**3.66 m**
(C) Draft (Inboards)	**32"***	**81.3 cm***
(C) Draft (Stern Drive Down)	**37"***	**94 cm***
(C) Draft (Stern Drive Up)	**27"***	**68.6 cm***

*** MINIMUM WATER DEPTH TO PREVENT RUNNING AGROUND**
Note: Inboard engines are standard equipment. Stern Drive engines are optional equipment.

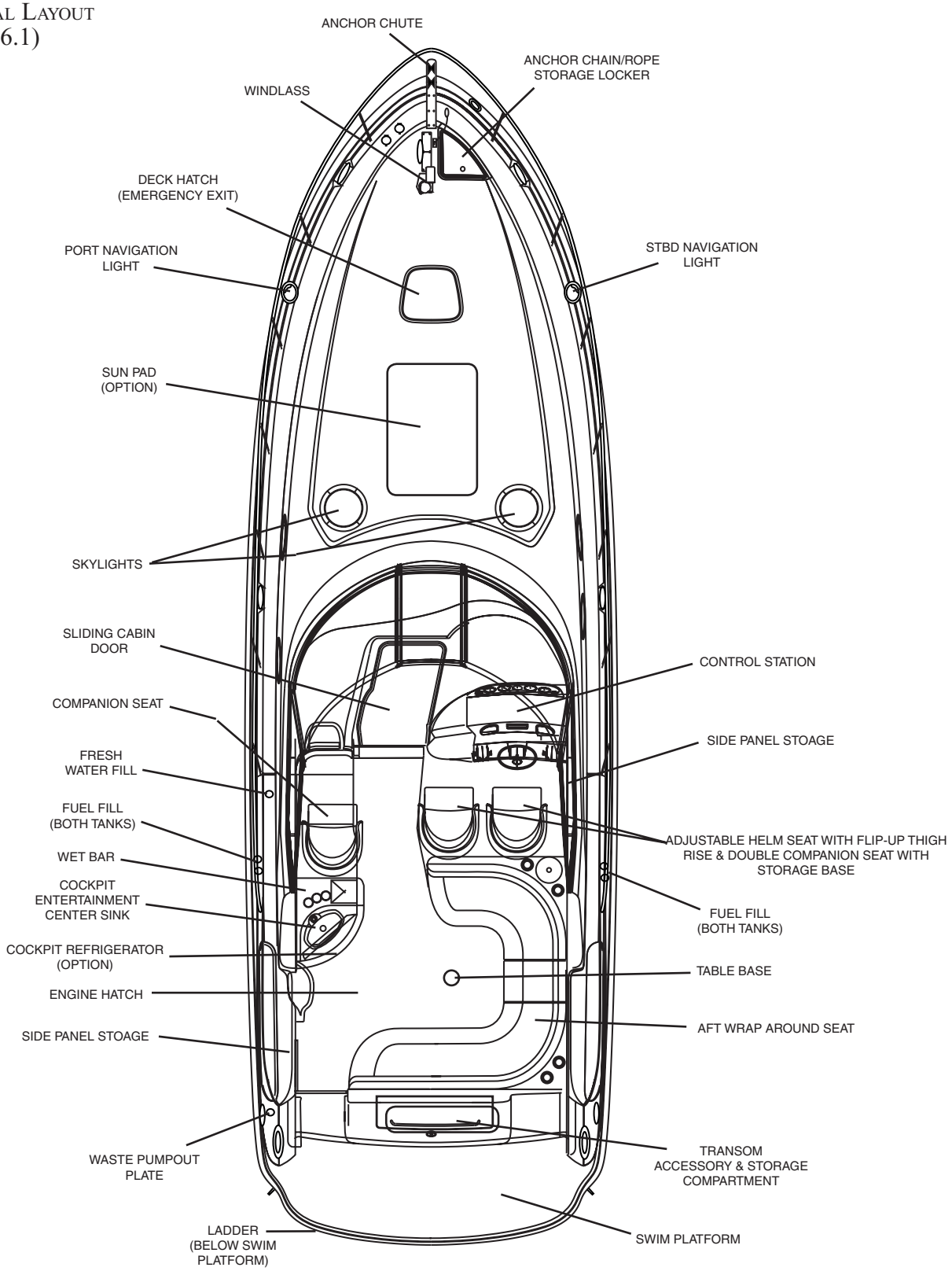
Dry Weight	**15,000 lbs.**	**6,804 kg.**
Fuel Capacity	**225 gal.**	**851 liters**
Useable Fuel	**214 gal.**	**809 liters**
Water Capacity	**45 gal.**	**170 liters**
Holding Tank	**28 gal.**	**106 liters**
Dead Rise	**21°**	

HEIGHT DIMENSIONS

(D) Keel To Top Of Spoiler	**12ft. 8in.**	**3.86 m**
(E) Waterline to Top of Spoiler	**10ft. 4in.**	**3.15 m**
(F) Spoiler To Top Of Mastlight	**14in.**	**35 cm**

6. DECK LAYOUT (UPPER DECK)

GENERAL LAYOUT
(FIG. 2.6.1)

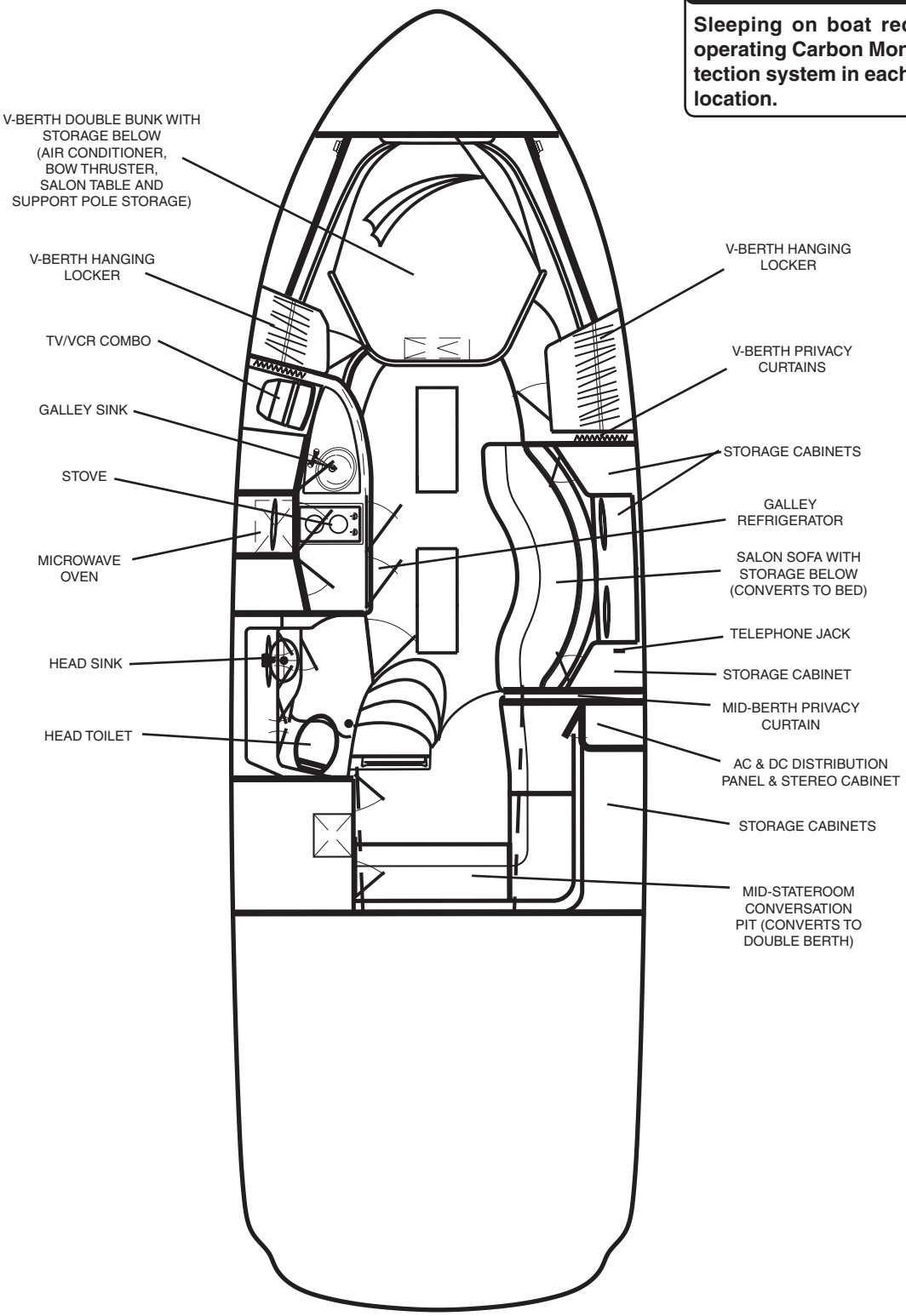


DECK LAYOUT (MID DECK/CABIN) (CONTINUED)

GENERAL LAYOUT
(FIG. 2.7.1)

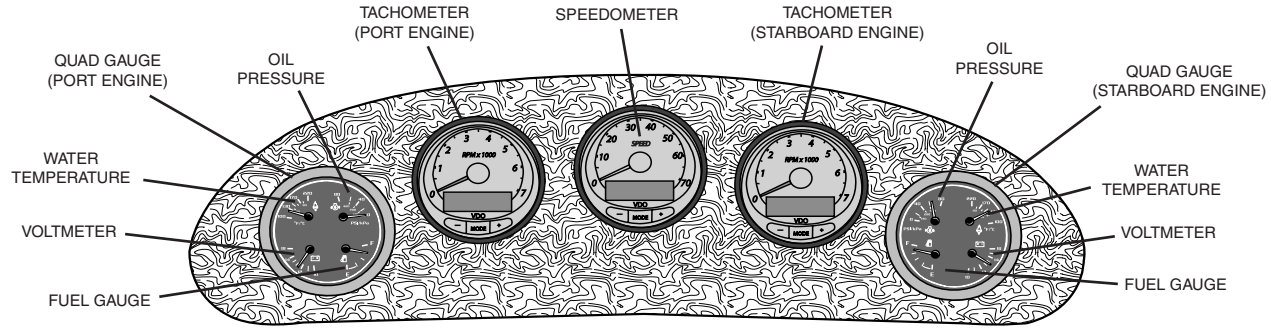
⚠ DANGER

Sleeping on boat requires an operating Carbon Monoxide detection system in each sleeping location.

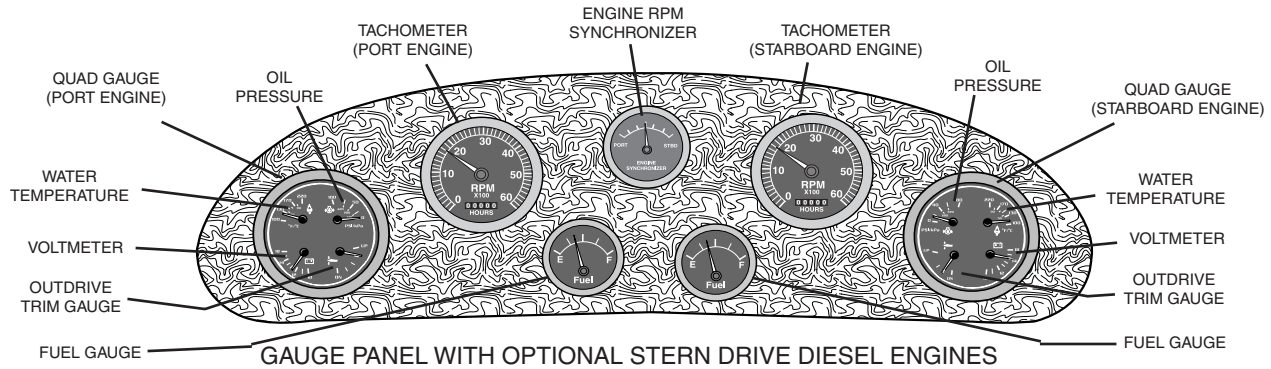


7. HELM, GAUGE & SWITCH LAYOUT

GAUGE PANEL (FIG. 2.8.1)

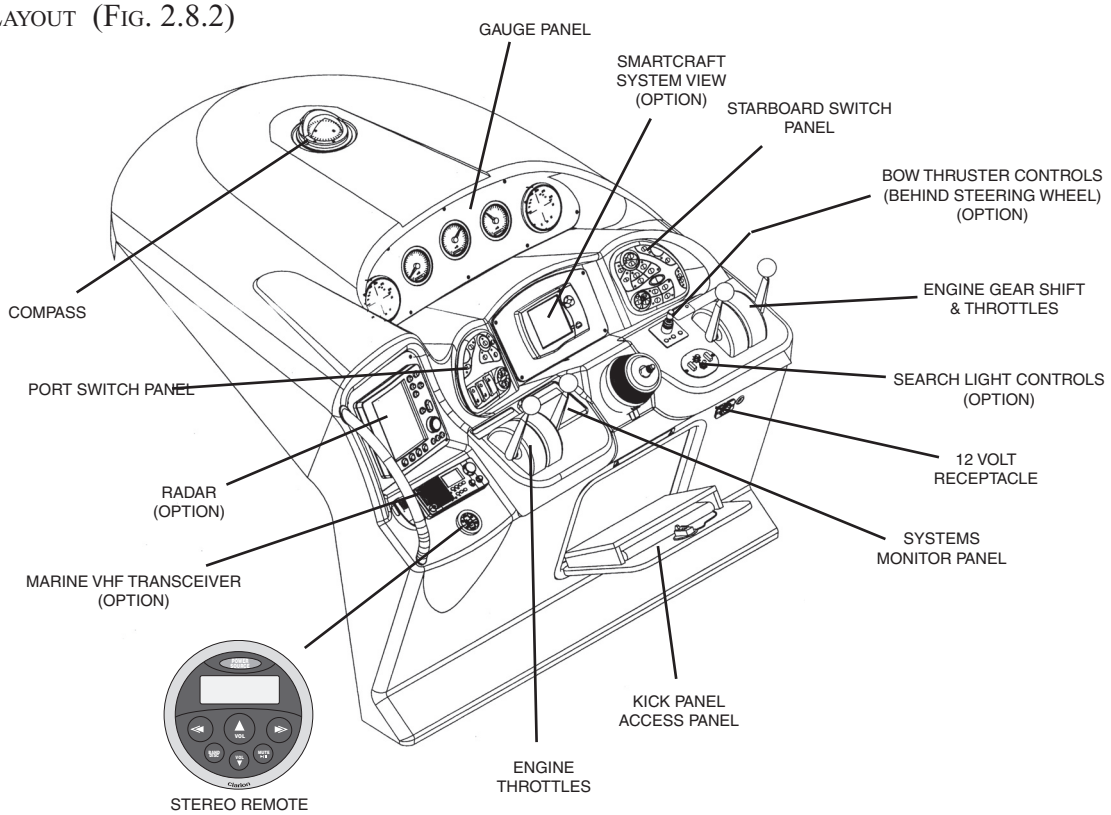


GAUGE PANEL WITH STANDARD INBOARD V- DRIVE ENGINES & SMARTCRAFT GAUGES



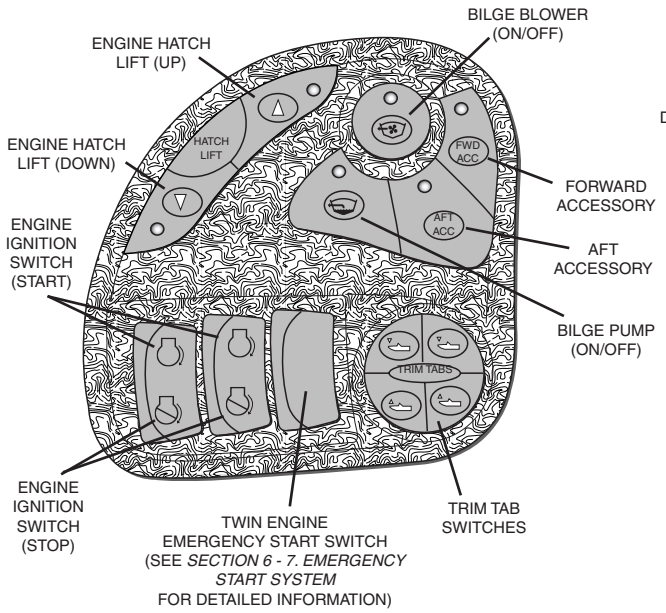
GAUGE PANEL WITH OPTIONAL STERN DRIVE DIESEL ENGINES

HELM LAYOUT (FIG. 2.8.2)

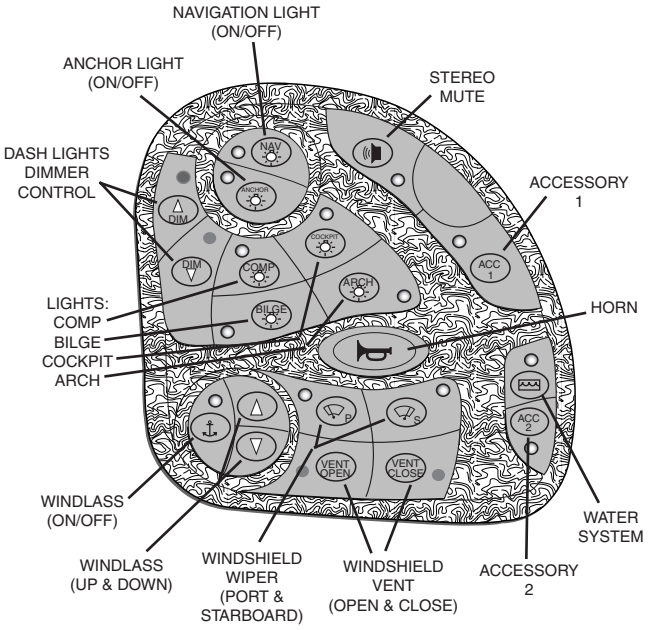


HELM LAYOUT (CONTINUED)

PORT SWITCH PANEL
(FIG. 2.9.1)

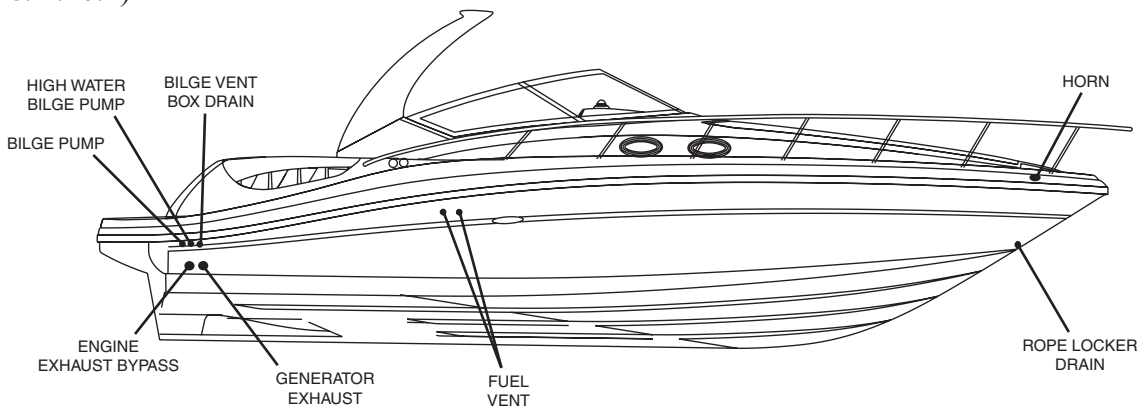


STARBOARD SWITCH PANEL
(FIG. 2.9.2)

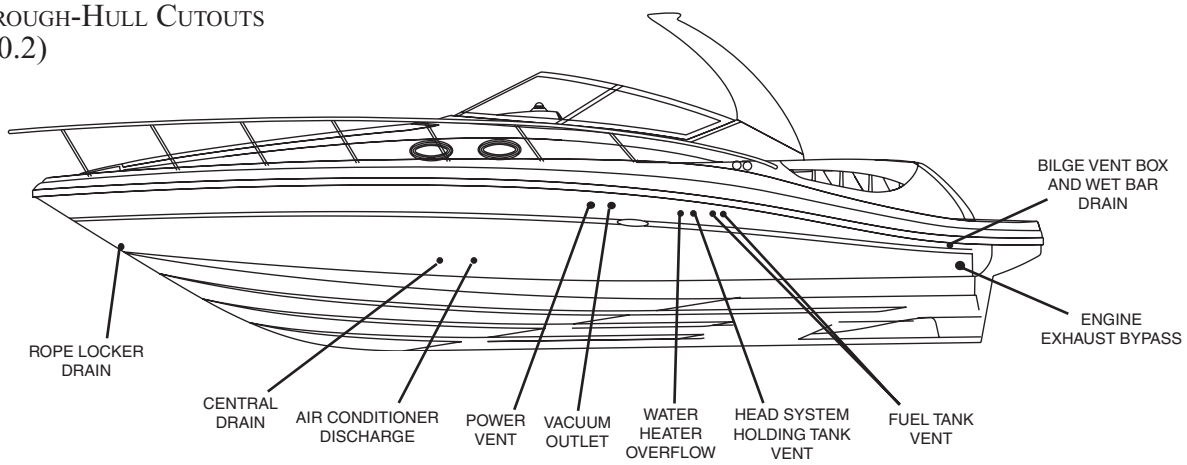


8. FUNCTION AND LOCATION OF THROUGH-HULL CUTOUTS

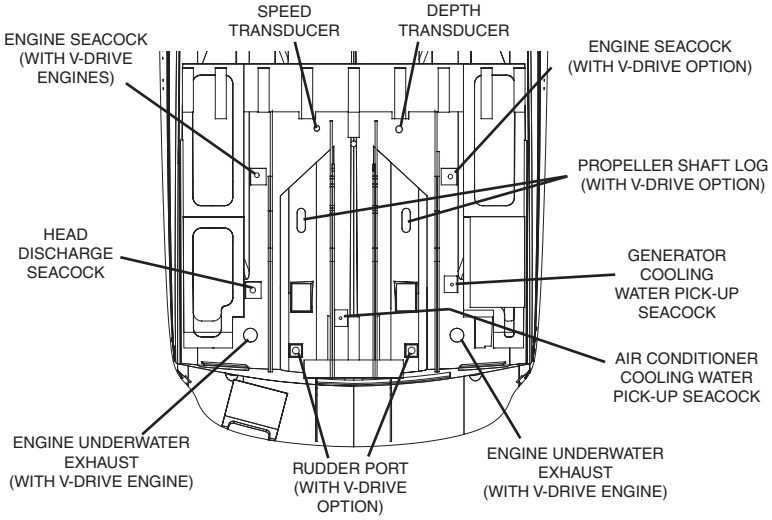
STARBOARD THROUGH-HULL CUTOUTS (FIG. 2.10.1)



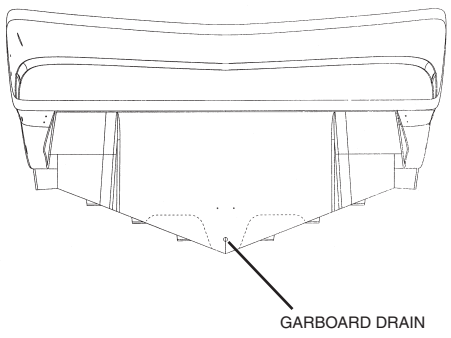
PORT THROUGH-HULL CUTOUTS (FIG. 2.10.2)



BILGE THROUGH-HULL CUTOUTS (FIG. 2.10.3)


SPEED TRANSDUCER
DEPTH TRANSDUCER
ENGINE SEACOCK (WITH V-DRIVE ENGINES)
ENGINE SEACOCK (WITH V-DRIVE OPTION)
PROPELLER SHAFT LOG (WITH V-DRIVE OPTION)
HEAD DISCHARGE SEACOCK
GENERATOR COOLING WATER PICK-UP SEACOCK
AIR CONDITIONER COOLING WATER PICK-UP SEACOCK
ENGINE UNDERWATER EXHAUST (WITH V-DRIVE ENGINE)
RUDDER PORT (WITH V-DRIVE OPTION)
ENGINE UNDERWATER EXHAUST (WITH V-DRIVE ENGINE)

TRANSOM THROUGH-HULL CUTOUTS (FIG. 2.10.4)



9. DESCRIPTION OF MAJOR CONTROLS

A. GEAR SHIFT AND THROTTLE CONTROL

There are two gear shift levers and two throttle control levers.

The gear shift levers have three positions: FORWARD, NEUTRAL (center), and REVERSE. The gear shift levers must be in the NEUTRAL position when starting the engines. A detent can be felt when the control is in exact neutral. **Forward and reverse positions should always be in the full travel extremes in either direction for positive engagement and minimum wear.** Each gear shift lever can be used independently from the other, for example, when idling one shift can be put in forward and the other in reverse for tight maneuvering. **Shift gears only with engines idling.**

The throttle controls regulate the RPM of the engines. Pushing the levers forward will increase engine RPM. Regulating RPM of the engines will control the speed of the boat through the water.

1. MAINTENANCE

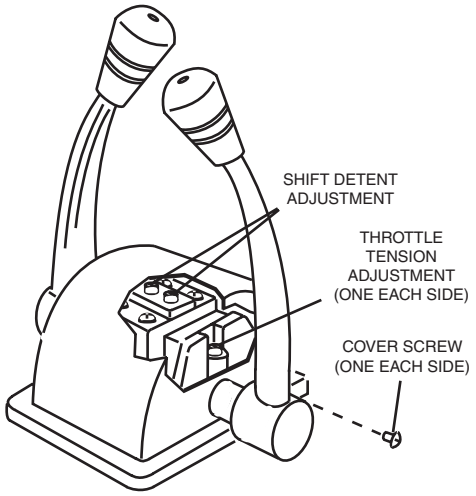
Periodically check and seasonally lubricate the linkages with medium weight oil.

Occasionally it will be necessary to adjust the tension on the cables to ensure a positive and direct response of the control lever action.

2. TO ADJUST CABLE TENSION:

- Remove the two (2) screws which attach the stainless steel dome and lift the dome free of the unit.
- With a screwdriver, turn the adjustment screw while moving the throttle lever back and forth until a positive action is obtained.
- Repeat the same procedure on the shift lever detent screw.

SHIFT & THROTTLE CONTROLS (CABLE) (FIG.2.11.1)

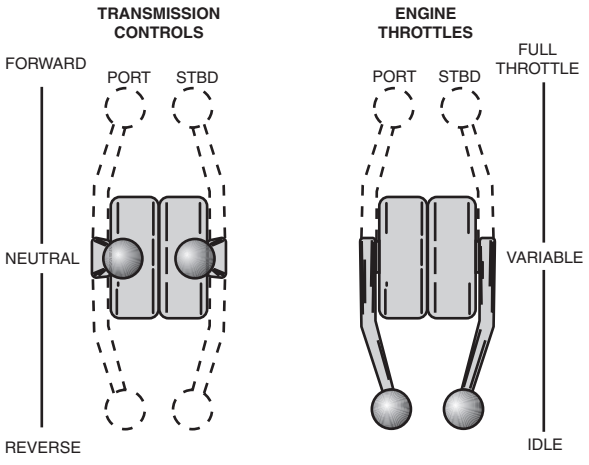


⚠ CAUTION

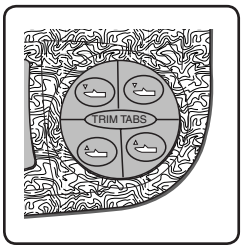
Cockpit can fill with water if boat is moving forward, when it is put into reverse.

Before shifting into reverse, shift to neutral, wait for boat to stop moving forward, then shift into reverse.

ENGINE SHIFT & THROTTLE FUNCTIONS (FIG. 2.11.2)



B. TRIM TABS



The trim tabs are two flat plates, hinged below the water line on the transom at the rear and are raised and lowered hydraulically by using the rocker switches located at the helm. (Figure 2.12.1).

The trim tabs are used to adjust the sideways listing of the boat due to uneven loading, a strong cross wind or propeller torque. The twisting effect of propeller torque is especially pronounced when running the engine at high horsepower output. To correct the listing, adjust the trim tabs to level the boat. When the boat is level, right to left, the steering effort will be the same for right and left turns.

Lower the trim tabs on the listing (lower) side by pushing the top half of the trim tab switch in one-half second bursts until the boat is righted.

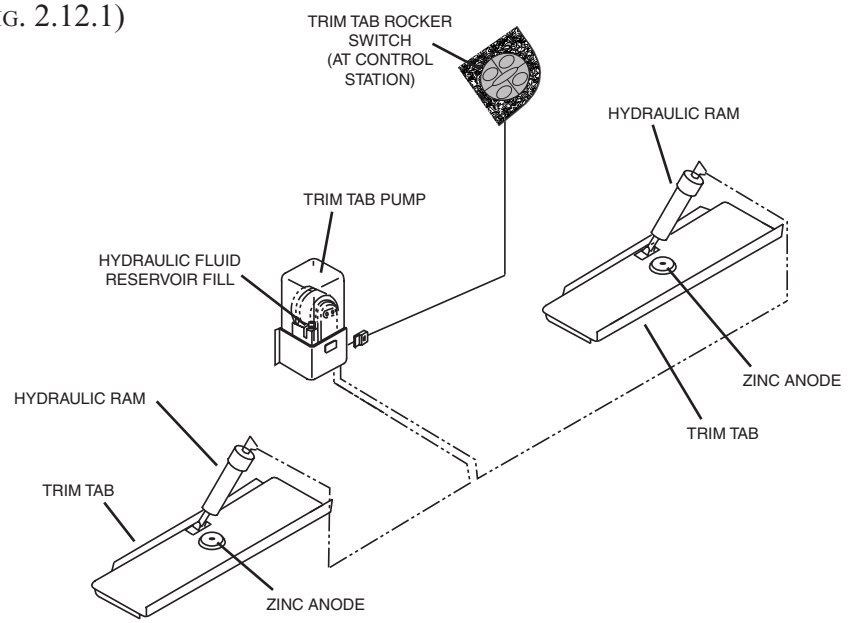
Using both switches to lower both tabs on a side-to-side balanced boat will lower the bow, when on plane, if the rear of the boat is highly loaded. Again, use only short bursts of the trim tab switches to adjust the trim.

When running at cruising speed, the trim tabs should be fully up, unless the rear is heavily loaded.

In heavy following seas or when running in an inlet, best maneuverability is obtained with a bow high attitude. To be sure the tabs are full up, push the bottom halves of the switches for several seconds.

RUNNING ATTITUDE	LIST	PUSH
BOW UP	.....	TOP OF BOTH SWITCHES
BOW UP	PORT	TOP OF STARBOARD SWITCH
BOW UP	STARBOARD	TOP OF PORT SWITCH
BOW DOWN	PORT	BOTTOM OF STARBOARD SWITCH
BOW DOWN	STARBOARD	BOTTOM OF PORT SWITCH

TRIM TABS (FIG. 2.12.1)



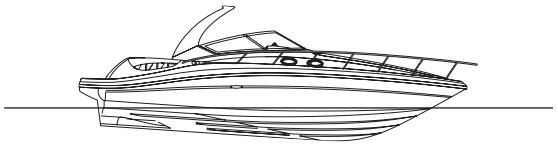
A. A Properly Trimmed Boat:

- Operates at a correct running attitude of a 3 to 5 degree angle to the water (bow slightly up).
- Reduces drag and increases fuel efficiency
- Preserves good forward visibility.
- Increases safety.

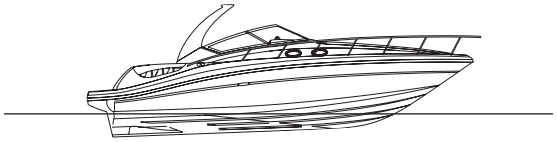
Use short bursts of trim tab switches to adjust trim tabs. Holding switches too long at once may cause sudden steering problems. Adjusting one trim tab more than the other will adjust list caused by improper equipment storage, too many people on one side or a strong cross wind.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

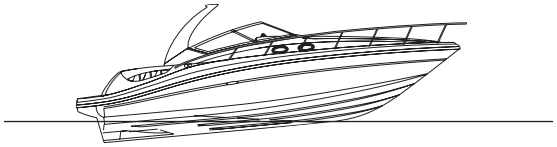
EFFECTS OF TRIMMING
(FIG. 2.13.1)



BOW-DOWN ("PLOWING")

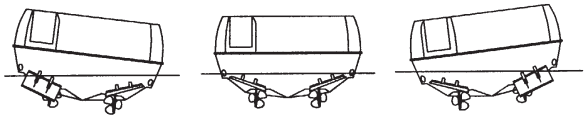


PROPER TRIM (3-5° BOW-UP ANGLE)



BOW UP ("PORPOISING")

EFFECTS OF PORT AND STBD TRIM TAB ADJUSTMENT



PORT TAB DOWN
PORT STERN UP
STBD BOW DOWN

BOTH NEUTRAL
NO CHANGE IN LIST

STBD TAB DOWN
STBD STERN UP
PORT BOW DOWN

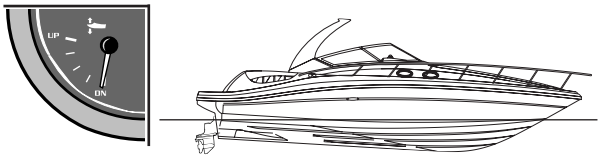
C. POWER TRIM UNIT AND GAUGE (WITH OPTIONAL STERN DRIVE I/O ENGINES)

The power trim allows the operator to raise and lower the stern drive units while underway to provide the ideal boat angle (in relation to water surface) for a given load and water condition (Figure 2.13.2).

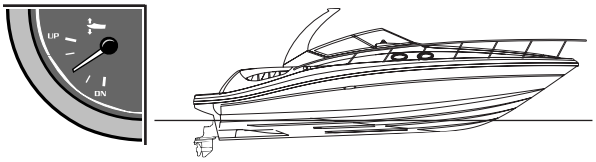
Trimming UP rotates the stern drive and propeller away from the transom. Trimming DOWN rotates the stern drive and propeller closer to the transom.

When the stern drives are trimmed DOWN, the bow of the boat is being forced down. If the trim is in the full DOWN position when accelerating from idle to plane, the boat will plane faster with less bow rise. Once on plane, the stern drive units can be trimmed UP slightly. This will raise the bow of the boat slightly and increase speed. You will need to try small differences in the stern drive position to determine the trim position you prefer under various conditions.

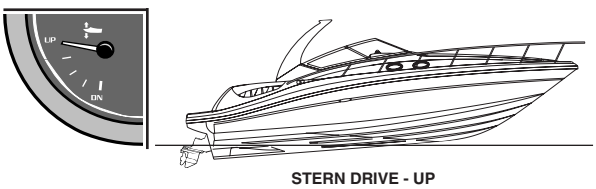
EFFECTS OF POWER TRIM
(FIG. 2.13.2)



STERN DRIVE-DOWN



STERN DRIVE - CENTERED



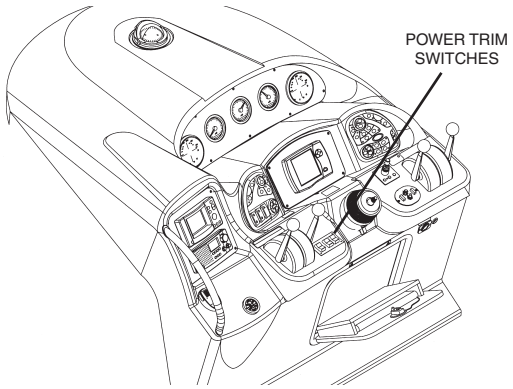
STERN DRIVE - UP

If you raise the stern drives up to far while you are on plane, you could cause a loss of speed and power due to condition called propeller "ventilation." If this happens, there will be a sudden increase in engine RPM and loss of speed. Do not let this condition exist. Immediately reduce your engine RPM and trim the outdrives DOWN slightly until engine slows down and you regain forward speed.

The trim gauges indicate the position of the stern drive relative to the transom.

REFER TO YOUR ENGINE OPERATOR'S MANUAL FOR PROPER TRIM GAUGE SETTING.

POWER TRIM SWITCHES (OPTIONAL) (FIG. 2.14.1)



D. TRAILER SWITCH (WITH OPTIONAL STERN DRIVE I/O ENGINES)

The trailer switch (power trim switch) (Figure 2.8.1) is not to be confused with the power trim function. The trailer switch is to be used only when the engine is OFF.

The trailer switch allows the drive unit to be raised for trailering, beaching and launching. To operate, press and hold the trailer switch (Figure 2.8.1) until the drive unit reaches the end of upward travel. The mechanism that raises the lower unit will stop operating at the end of the upward travel. To bring the drive unit down into boating position, push the

F. ENGINE ALARM SYSTEM

⚠ CAUTION

Always check oil pressure and water gauges while moving, even if your engine has an alarm.

Shut down engine immediately if gauges are not in normal ranges, or alarm sounds.

Do not restart engine until problems are corrected.

The engine Operator's Manual will tell you if your engine is equipped with an audible alarm and how to use it.

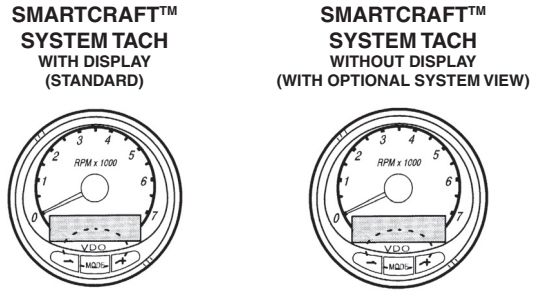
The alarm indicates a problem with engine water temperature, oil pressure and/or stern drive oil level.

10. IMPORTANT GAUGES

A. TACHOMETER

The tachometer indicates the revolutions per minute (RPM) of the engine. (It does not indicate the speed of the boat.) Your Engine Operator's Manual indicates the maximum full throttle RPM at which your engine should operate. This must not be exceeded or serious engine damage will occur. The tachometer should also be used to determine the most comfortable and economical cruising RPM.

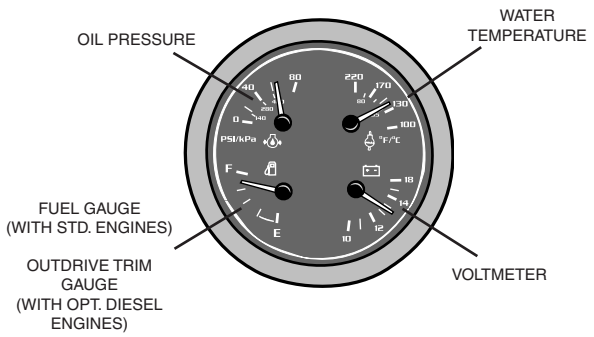
SMARTCRAFT™ TACHOMETERS (FIG. 2.14.2)



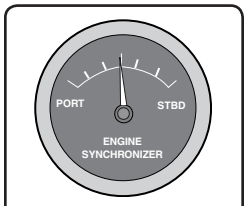
B. OIL PRESSURE, WATER TEMPERATURE, VOLTMETER AND FUEL GAUGES

These gauges function on your boat the same way they do on your car or truck. You must continually check these gauges visually to make certain there are no engine system problems even if your boat engine has an alarm system.

SMARTCRAFT™ QUAD GAUGE
(FIG. 2.15.1)



C. ENGINE RPM SYNCHRONIZER GAUGE (WITH STERN DRIVE ENGINE OPTION)



(FIG. 2.15.2)

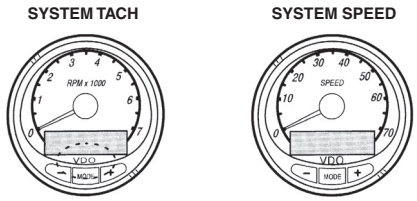
The synchronizer gauge indicates which engine is running slower by the needle registering to the slower engine. To synchronize the engines, adjust the engine RPM with the throttles until the needle is centered in the gauge. The engine synchronizer is designed to operate between 1500 RPM and Wide Open Throttle (WOT). When engine are not under load and running in neutral gear, they will tend to surge and indicate out of synchronization very easily.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

D. SMARTCRAFT™ GAUGE SYSTEMS (STANDARD)

Your boat is equipped with the SmartCraft™ instrumentation system. The SmartCraft™ system consists of a smart tachometer and speedometer with display screens.

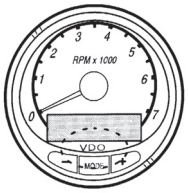
SMARTCRAFT™ GAUGE SYSTEM
(FIG. 2.15.3)



The SmartCraft™ system provides a wide range of engine, boat systems and environmental information to the boat operator to help make your time on the water more enjoyable by providing accurate systems information in one convenient location, right at the helm. Below is a list of features the SmartCraft™ system offers.

Refer to the SmartCraft™ owner's manual in the owner's packet for all SmartCraft™ operating instructions.

Some features include:
(Depending on engine type and software version)

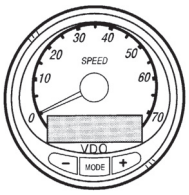


(FIG. 2.15.4)

System Tach Display Screen:

- Engine Break-in
- Engine Temperature
- Oil Psi
- Trim and RPM
- Trim and Water Pressure
- Water Pressure
- Battery Voltage
- Engine Hours
- Fuel Flow and Fuel Used
- RPM
- Depth

System Speed Display Screen:



(FIG. 2.16.1)

- Speed
- Fuel Used
- COG/SOG - If GPS Input Distance and fuel to waypoint - *if waypoint programmed into optional GPS*
- Clock with Air/Sea Temp
- Inst. and Ave. Fuel Economy
- Trip Odometer
- Fuel Tank Levels
- Fresh Water Tank 2 or Level(s)
- Waste Water Levels(s) or
- Dual Engine - Trim and RPM Synchronizer
- Fuel Range
- Fuel Economy
- Trip Odometer

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

E. SMARTCRAFT™ SYSTEM VIEW (OPTION)

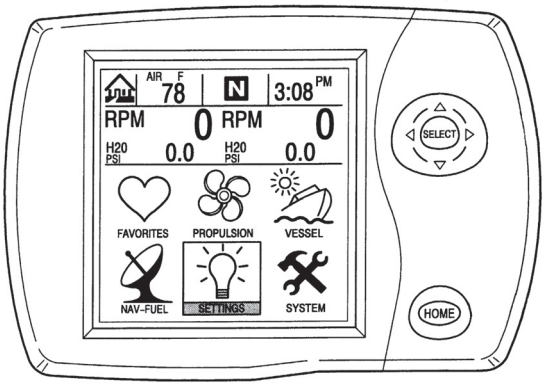
Your boat may be equipped with the SmartCraft™ System View system. The SC5000 System View Display is a comprehensive boat information center. System View allows the boat operator to receive a wealth of critical operational information, displayed clearly and instantly at the helm on the LCD display.

The System View continuously monitors and reports information ranging from basic operating data to detailed vessel environment information.

System View covers all of the features listed under System Tach and System Speed plus:

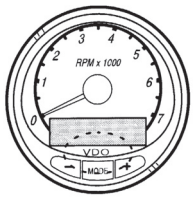
- Water Temperature and Depth
- Engine Trim Status
- Boat Speed
- Steering Angle

SMARTCRAFT™ SYSTEM VIEW (HOME SCREEN) (FIG. 2.16.2)

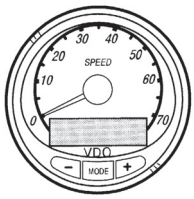


GAUGES WITH SYSTEM VIEW
(REPLACES STANDARD SYSTEM TACH & SYSTEM SPEED)

SMARTCRAFT™ SYSTEM LINK TACHOMETER
WITHOUT DISPLAY
(WITH OPTIONAL SYSTEM VIEW)



SMARTCRAFT™ SYSTEM LINK SPEEDOMETER
WITHOUT DISPLAY
(WITH OPTIONAL SYSTEM VIEW)



- System Preventive Maintenance Reminders
- System Diagnostics

System View can also be fully integrated with the boat's GPS, if equipped, to provide up to the minute course, speed, and fuel-to-destination information.

***Note**: The detailed information listed which is standard on some models may be optional on others, or may not be available on some models based on engine and system configuration.*

Your Sea Ray® dealer may have already done this for you. If this has not already been done by your dealer refer to the *System Calibration* section of the SmartCraft™ System View owner's manual found in the owner's packet.

Refer to the SmartCraft™ System View owner's manual in the owner's packet for all SmartCraft™ operating instructions.

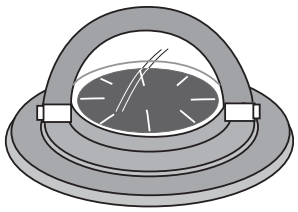
System Calibration (For First Time Use)

When using SmartCraft™ System View for the first time the system must be calibrated before normal use.

F. Magnetic Compass

Your compass, properly corrected, will indicate magnetic north (not true north). A compass must be adjusted by a qualified person. The reason for this is that nearby instruments or objects containing magnets or current-carrying electrical wires will influence the compass reading. This is especially true if you add electronic devices to the helm station.

Magnetic Compass
(Fig. 2.17.1)



After your compass has been professionally adjusted. You will be given a deviation card or chart indicating the correction to be applied when laying out a compass course or making navigational calculations. **Keep this correction card or chart at the helm.**

NOTE: The compass adjustment is only good for the equipment arrangement that existed at the time of the adjustment. If you place different equipment or remove equipment from the vicinity of the compass, you cannot rely on the compass reading. The compass must be readjusted by a qualified person after equipment is added or removed from the vicinity of the compass.

NOTE: The compass roses shown on navigational charts have both true north and magnetic north directions superimposed. Make certain you plot course compass directions from the magnetic north compass rose.

When not in use, the compass should be protected from excessive and prolonged sunlight. If your compass becomes sluggish or erratic, it should be serviced by an authorized repair station.

To keep the plexiglass dome free from scratches, remove salt deposits and dust with a damp cloth. An occasional treatment with paste wax will help preserve the dome surface.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

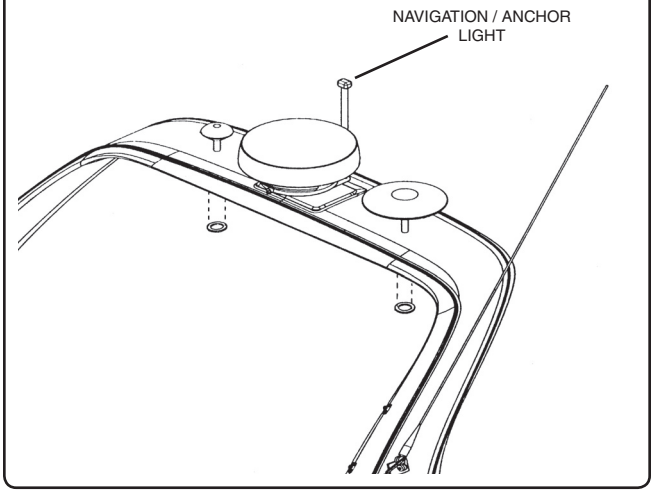
11. NAVIGATION AND ANCHOR LIGHTS

Navigation lights (Figure 2.18.1) MUST be on while underway from sunset to sunrise or in conditions of reduced visibility. "Underway" means the boat is not docked or at anchor. Trolling or drifting with engine off is considered "underway" and navigation lights must be used.

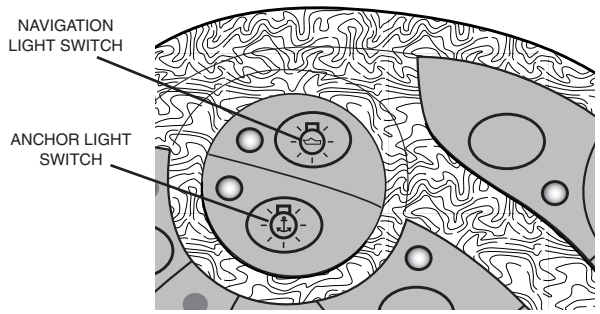
If you are anchored in open water, i.e. where other boats can approach yours, you must display your anchor light (Figure 2.18.2): a white light that can be seen from all possible directions, i.e. 360 degrees.

Read the "Federal Requirements and Safety Tips for Recreational Boats" provided in your kit.

MAST LIGHT ON ARCH
(FIG. 2.18.2)



NAVIGATION AND ANCHOR LIGHT SWITCHES
(RIGHT HELM SWITCH PANEL) (FIG. 2.18.1)



1. PRE-LAUNCH, LAUNCH AND POST-LAUNCH CHECKLIST

Listed below are the critical items you must check and do each time you use your boat. It does not list all of the necessary maintenance and service items required to keep your boat running properly. These other items are found in Section 8.

BEFORE LAUNCH

- ❒ Drain plug installed
- ❒ Enough fuel for trip
- ❒ Float plan given to friend or relative
- ❒ Navigation charts for trip
- ❒ Weather forecast - safe

IN THE WATER, BEFORE BOARDING PASSENGERS OR STARTING ENGINE

- ❒ Equipment stored and balanced
- ❒ No gas smell in engine compartment
- ❒ Engine oil and steering fluid levels - OK
- ❒ Battery switch on
- ❒ Bilge pump working
- ❒ Bilge blower on
- ❒ Radio and navigation equipment functioning

PASSENGERS

- ❒ Wearing PFDs
- ❒ Seated properly
- ❒ Given safety instructions

STARTING ENGINE

- ❒ Make sure you have read and understand the dangers of Carbon Monoxide (CO) information in this manual.
- ❒ Bilge blower on for at least four (4) minutes. Feel to confirm airflow at hull vent on hull side. Inspect bilge area for visual and odor confirmation that there are no fuel leaks.
- ❒ Gear shift in neutral position. Throttle pumped before starting, if necessary.
- ❒ Oil pressure, engine temperature, voltage - OK after starting and warm up.

UNDERWAY

- ❒ Gradual acceleration and deceleration and turning.
- ❒ Aware of surroundings at all times.
- ❒ Operate so as to prevent buildup of Carbon Monoxide (CO)
- ❒ Monitor weather
- ❒ Use navigational aids in water and on shore
- ❒ Keep passengers safe
- ❒ Check fuel consumption regularly
- ❒ Check all gauges frequently

END OF TRIP

- ❒ Equipment dry and stored.
- ❒ Electronic equipment and switches off.
- ❒ Battery switch off.
- ❒ Notify person who had float plan.
- ❒ Boat covered properly for trailering, docking or mooring.
- ❒ If boat is pulled from water, drain plug removed.
- ❒ If boat is pulled from water, hull and propeller inspected for damage.

⚠ WARNING

An improper trailer can cause structural damage to the hull.

A damaged hull can be unsafe; it could cause the boat to sink.

Use a trailer that can properly support the boat's weight and shape. Get professional help in picking the right trailer for your boat.

2. FUELING THE BOAT

⚠ DANGER

NO SMOKING
GASOLINE VAPORS ARE EXPLOSIVE

NOTICE

GASOLINE RECOMMENDATIONS

Minimum octane rating of 87 AKI.

Refer to the engine owner's manual for additional information

⚠ DANGER

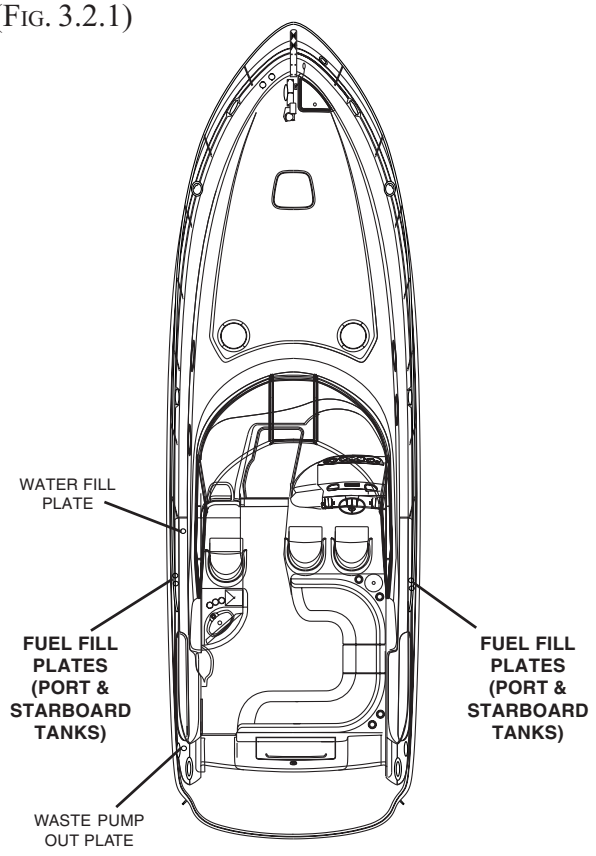
Gasoline vapors can explode from static electricity if fueling is not done properly.

Read and understand this section

The fuel fill caps are located on the midship port and starboard sides of the boat (Figure 3.2.1). Do not mistake the water tank fill and waste pump out caps for the gasoline fill cap.

Refer to your engine manual for the proper grade of gasoline.

FUEL FILL LOCATION
(FIG. 3.2.1)



BEFORE FUELING

- Fuel during daylight hours.
- If the left (port) side of the boat is against the dock, remember that the waste pump out cap is also on left (port) side of the boat. Do not confuse the waste pump out cap with the fuel fill cap.
- Tie boat to the dock.
- Shut off engine, bilge blower and all other electrical equipment.
- Shut off gas burning appliances (gas stove, etc.).
- Close all hatches, doors and keep engine compartment closed to prevent gasoline fumes from entering the cabin or cockpit area.
- All passengers must leave the boat, as a precaution.
- There must be no smoking or any flames within 20 feet of the boat, before, during and for at least 5 minutes after fueling is completed.
- Open fuel fill cap and insert hose nozzle into the fuel fill opening. Fuel fill hose nozzle must contact the fuel fill opening BEFORE adding fuel to prevent discharge of static electricity.

FILLING THE TANKS

- For your convenience fuel fill hoses attach to T fittings at the fuel tanks allowing both fuel tanks to be filled from either the port or starboard side.
- Check the fill plate label to ensure that fuel is placed ONLY in the fuel tank. The fuel fill plates

are located on the midship port and starboard sides of your boat (Figure 3.2.1). You only need to fill the tanks from one side of the boat.

- Keep nozzle in contact with fuel fill opening at all times during fueling.
- Listen as tank fills and stop adding fuel before it spills from the vent. Fuel must have room for expansion.
- Fill both port and starboard fuel tanks.

AFTER FILLING

- DO NOT wash spilled fuel overboard. Wipe up any spill with rags or paper towels and dispose of them properly on shore.
- Open engine compartment and check for fuel fumes. This is especially important if your boat is equipped with gasoline engines. Leave compartment open until no odor is apparent. Close compartment.
- If fumes in the engine compartment do not disappear, do not turn on blower or start engine. Get help from trained and experienced persons before using the boat.
- Turn on blower for four minutes, then restart engine.
- Assist passengers back into the boat.

3. BOARDING

⚠ WARNING

Wet decks are slippery.

You can be seriously injured if you slip and fall.

Wear slip-resistant footwear secured to your feet and hold onto rails or boat structure.

- DO NOT overload the boat.
- Board one person at a time and give assistance as needed.
- Transfer gear and equipment by handing it from a person on the dock to a person on board. You can lose your balance and be injured if you attempt to board while carrying equipment or gear.
- Distribute the weight of equipment and passengers as evenly as possible to keep the boat balanced.
- Stow gear and equipment so that it is accessible, but everything is to be stored in places so as to prevent it from flying about if the boat encounters rough water or weather.

4. PERSONAL FLOTATION DEVICES (PFD'S)

- Operator must instruct all passengers on location and use of PFD's (See *Section 1-Safety, page 4* for type and usage).
- Children less than sixteen (16) years of age and all non-swimmers, adults as well as children, must wear properly-sized PFDs at all times when aboard.
- ALL passengers should wear PFDs. By the time someone falls overboard, it can be to late for them to put on a PFD and fasten it properly. This is especially true in colder waters, below 70°F, where survival time, before hypothermia sets in, is measured in minutes.
- If there are passengers not wearing PFDs, the PFDs must be readily accessible. "Readily accessible" means out of the storage bag and unbuckled.
- All throwable flotation devices (cushions, rings, etc.) must be right at hand.

5. PASSENGER INSTRUCTION AND LOCATION

- Everyone on board must be told about the boat's behavior from starting to getting up on plane.
- Before the operator does any high-speed maneuvers or rapidly accelerates or decelerates the boat, passengers must be warned to sit and hold on and must heed the warning.
- The operator may have to make rapid changes in speed and/or direction to avoid a problem, with little or no time for alerting passengers. It is critical that all passengers be seated in the designated seating areas and holding on to prevent falling overboard or getting knocked about in the boat at all times when the boat is underway.
- If standing, maintain firm grip on hand holds. When walking, grasp handholds.

6. STARTING THE ENGINES

⚠ DANGER

Gasoline vapors can explode

Before starting the engines, open engine compartment and check for gasoline smell.

- **If you smell gasoline, do not start engine; get everyone off the boat and get trained help to find and fix the problem.**

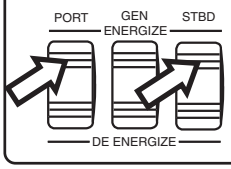
If there is no gasoline smell, perform checks specified by manual, then and only then, close engine compartment and run blower for at least 4 minutes before starting.

The engine operation and maintenance manual furnished with your boat describes pre-start and starting procedures. We urge you to thoroughly read and understand your engine manual.

Listed below are basic pre-start and starting reminders. These are not a substitute for the engine manufacturer's specific recommendations.

1. Check battery switches for ON position (see *Section 6 – Electrical System*). Open the engine compartment and check for the smell of gasoline.

(FIG. 3.4.1)



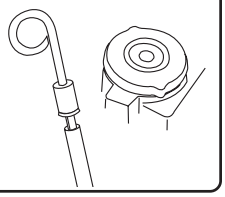
- IF YOU SMELL GASOLINE, get everyone off the boat, do not operate any electrical switches or light any matches, lighters, etc. Get trained help to find and fix the problem, before starting the engine or operating any switches on the boat.

(FIG. 3.4.2)

- If you DO NOT smell gasoline.

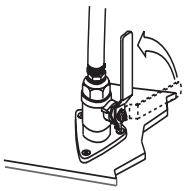
2. Check all fluid levels and any other necessary checks as specified in Section 8 and in the engine manual.

(FIG. 3.4.3)



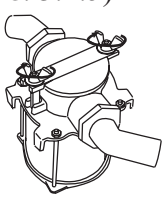
3. Check that water level in bilge is minimal. Verify that the bilge pump is operating by turning the bilge pump switch to MANUAL and listening for the pump running and check to see that bilge water is being pumped overboard.
4. With inboard V-Drive engines, check seacocks for open position.

(FIG. 3.4.4)



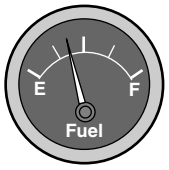
5. With inboard V-Drive engines, make sure strainers are clean and water tight (see *Section 2 – Bilge and Underwater Gear*).

(FIG. 3.4.5)



6. Check fuel level. Be sure you have enough fuel for your trip. Remember the "1/3 Rule": Use no more than 1/3 of your fuel for outbound trip; use 1/3 of the fuel for return trip; keep 1/3 for reserve in case of emergency.

(FIG. 3.5.1)



7. Run bilge blowers for at least 4 minutes before attempting to start engine

(FIG. 3.5.2)

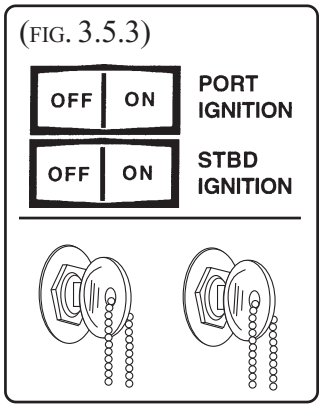
Unlike your automobile engine which is naturally ventilated even when it is not moving, your boat engine compartment (the bilge) does not have sufficient natural ventilation when the boat is not moving or moving slowly. That is why the engine compartment must have forced ventilation, using the bilge blower, to remove potentially explosive gasoline vapors, before the engine is started and when the boat is moving slowly.

Because it may be difficult to remember to turn on the bilge blower every time you slow down the boat, it is recommended that the bilge blower run all the time when the engines are running.

8. TO START ENGINE:

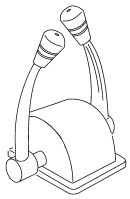
Turn ON ignition breakers and ignition keys on the cabin DC distribution panel.

(FIG. 3.5.3)



9. Put throttle into idle position and shift control lever into neutral; then for a:

(FIG. 3.5.4)



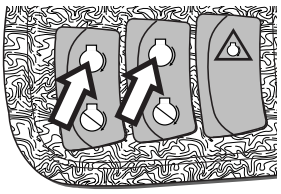
COLD ENGINE - Move throttle lever forward to full open throttle, then return to about 1/4 throttle.

WARM ENGINE - Move throttle lever about 1/4 open throttle position. Do not pump lever.

FLOODED ENGINE - Move throttle lever to full open position. DO NOT pump lever. When the engine starts, move throttle lever back rapidly to decrease engine speed to between 1000 and 1500 RPM.

10. Press on the top of the engine START/ STOP switch on control station switch panel. Do not crank engine for more than a few seconds if it doesn't start. Engine may be very cold or flooded; see step 7.

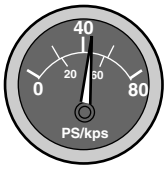
(FIG. 3.5.5)



11. After engine starts, reduce speed to between 1000 and 1500 RPM and check oil pressure.

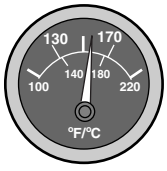
12. If oil pressure is correct, let engine warm up to normal temperature range as specified in the engine manual, before shifting into forward or reverse gear.

(FIG. 3.5.6)



IF ENGINE TEMPERATURE GOES ABOVE NORMAL RANGE. SHUT DOWN THE ENGINE IMMEDIATELY. GET TRAINED HELP TO FIND AND FIX THE PROBLEM.

(FIG. 3.5.7)



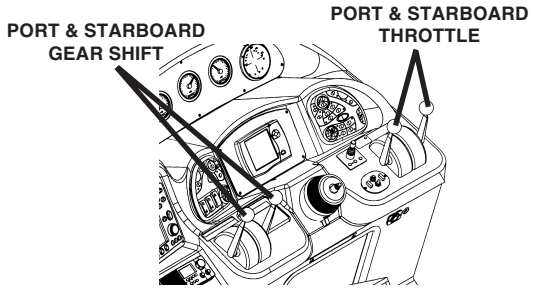
IF OIL PRESSURE GOES ABOVE OR BELOW OPERATING RANGE, SHUT ENGINE DOWN IMMEDIATELY. GET TRAINED HELP TO FIND AND FIX THE PROBLEM.

7. SHIFTING TO DRIVE THE BOAT

Move throttle lever to idle position.

Then move shift lever rapidly, either forward or reverse, but not very far from the neutral position. The drive unit will engage and boat will start to move slowly in either forward or reverse. You can damage the transmission if you do not shift quickly from neutral into gear. Once clear of the dock, mooring, people and/or the no-wake zone and the boat has been shifted into forward gear, move shift/throttle lever forward to desired engine speed.

(FIG. 3.6.1)



⚠ CAUTION

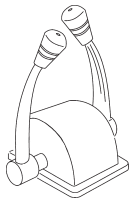
Cockpit can fill with water if boat is moving forward, when it is put into reverse.

Before shifting into reverse, shift to neutral, wait for the boat to stop moving forward, then shift into reverse.

8. STOPPING THE ENGINES

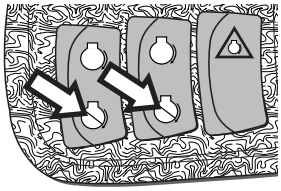
1. Move shift/throttle lever to NEUTRAL and let engine idle for about 5 minutes to allow engine to cool down.

(FIG. 3.6.2)



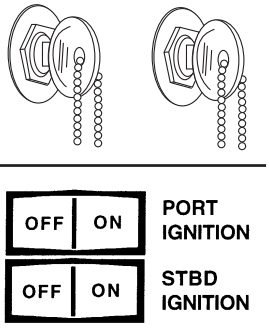
2. Press on the bottoms of the engine START/STOP switches on the control station switch panel.

(FIG. 3.6.3)



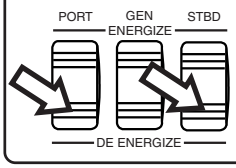
3. Turn OFF ignition keys and ignition breakers on cabin DC distribution panel.

(FIG. 3.6.4)



4. If you are leaving the boat for more than two hours, turn OFF battery switches.

(FIG. 3.6.5)



9. STEERING SYSTEM (WITH STANDARD INBOARD V-DRIVE ENGINES)

The hydraulic steering system is used primarily on boats with inboard engines such as the 340 DA. Strict adherence to the following guidelines must be followed to ensure safe recreational boating.

⚠ WARNING

Failure of the steering system will cause loss of control of your boat. Any change in steering such as looseness, tightness, binding, etc., must be checked immediately by your Sea Ray dealer.

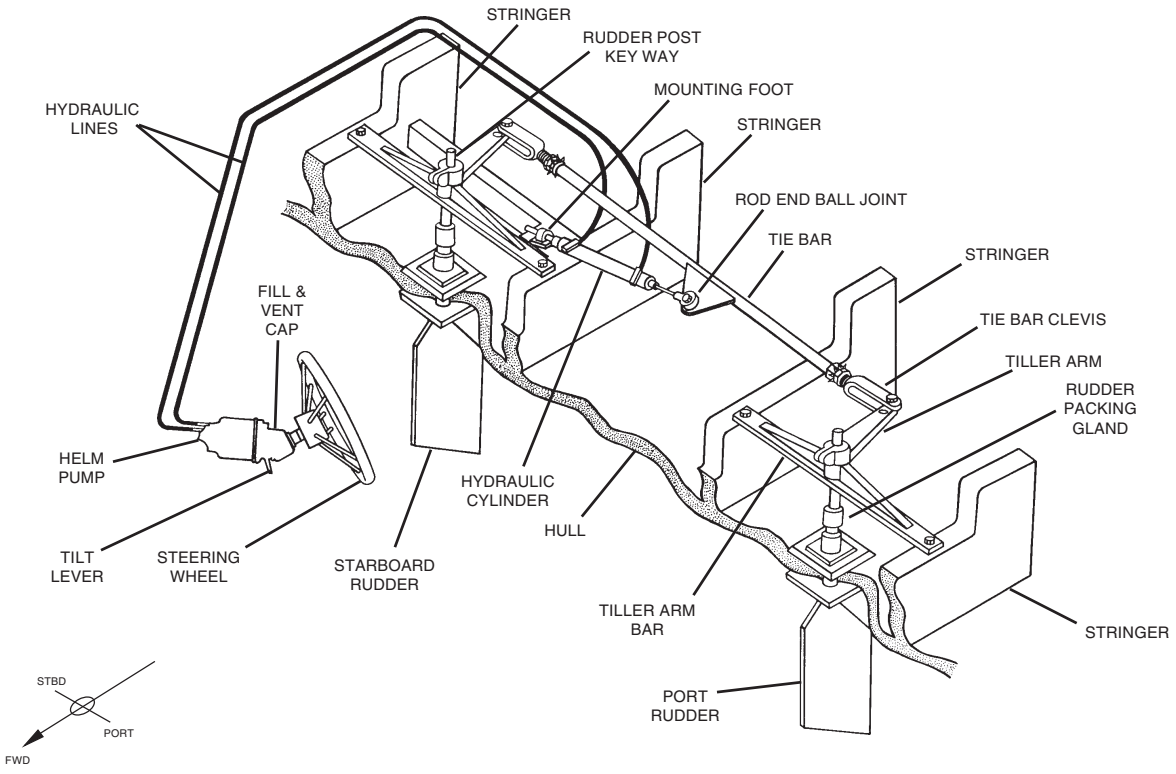
Periodically remove the plug in the helm unit and check the oil level visually. The oil level should be within 1/2" (1-1/4 cm) of the filler hole.

The system must be filled with hydraulic oil meeting Mil Spec H-5606 A. Refer to steering system owner's information in the owner's packet for specific hydraulic oils that can be used.

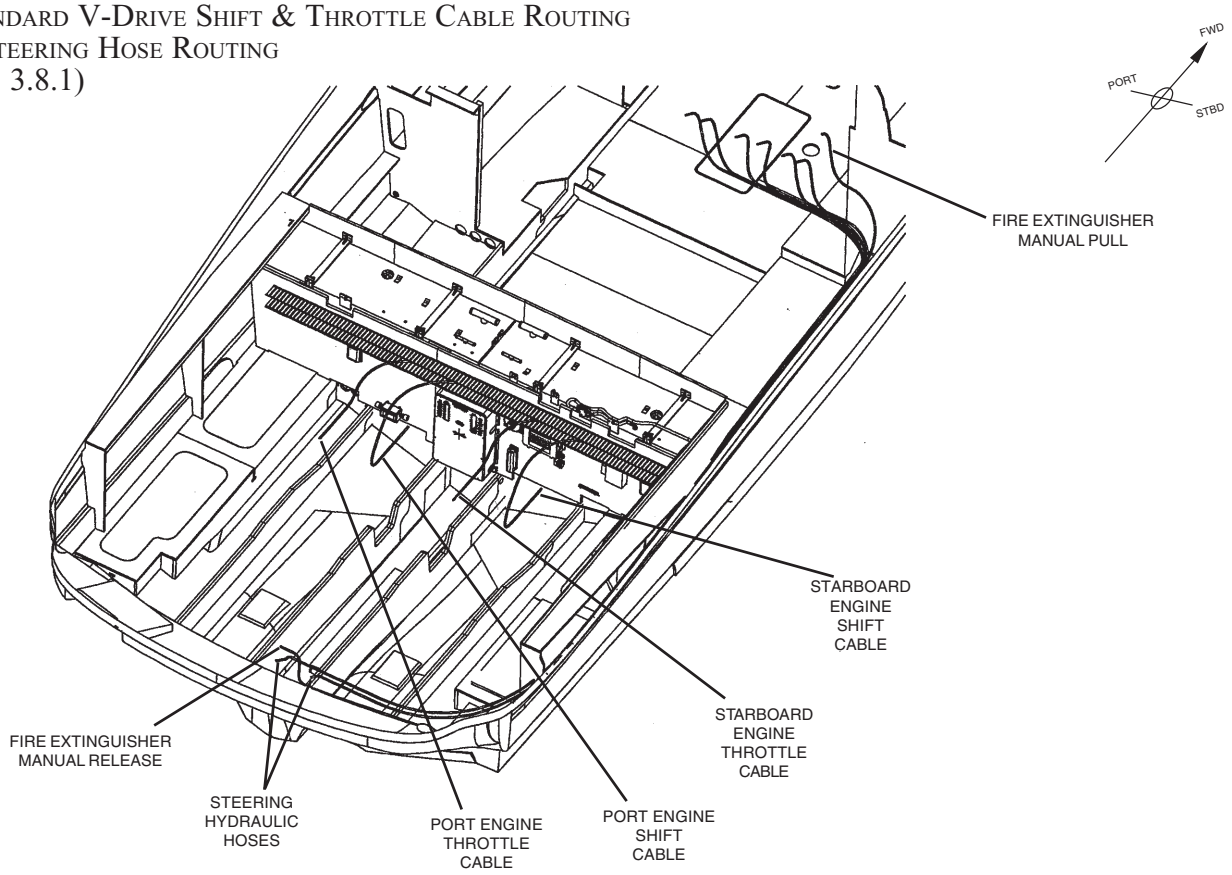
Periodically check the mechanical connections and linkages at the cylinder. Replace worn parts, tighten loose parts and lubricate as needed. The steering system is protected against over-pressure situations by a pressure relief valve. Sometimes when returning the wheel from a hard-over position, a slight resistance may be felt and a clicking noise may be heard. This is a completely normal situation caused by the releasing of the lockspool in the system.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

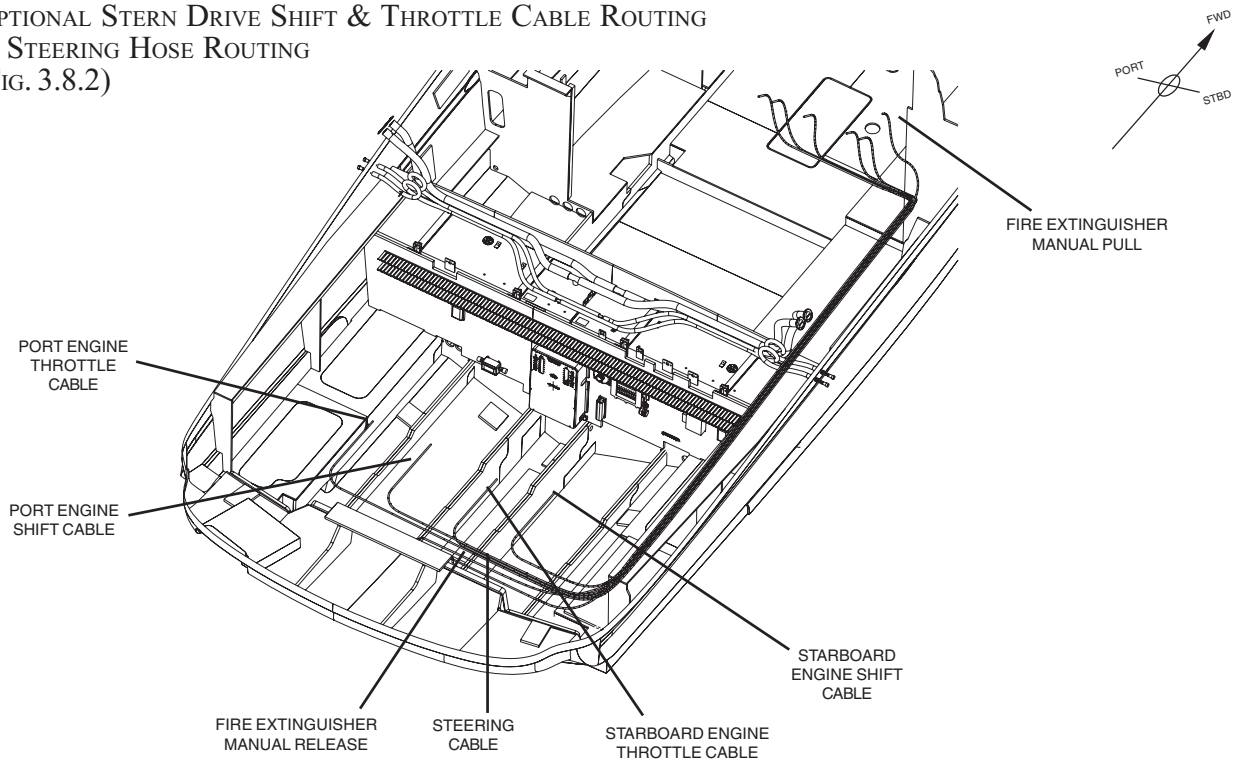
HYDRAULIC STEERING ASSEMBLY
(FIG. 3.7.1)



STANDARD V-DRIVE SHIFT & THROTTLE CABLE ROUTING
& STEERING HOSE ROUTING
(FIG. 3.8.1)



OPTIONAL STERN DRIVE SHIFT & THROTTLE CABLE ROUTING
& STEERING HOSE ROUTING
(FIG. 3.8.2)



10. STEERING SYSTEM (WITH OPTIONAL INBOARD/ OUTBOARD ENGINES)

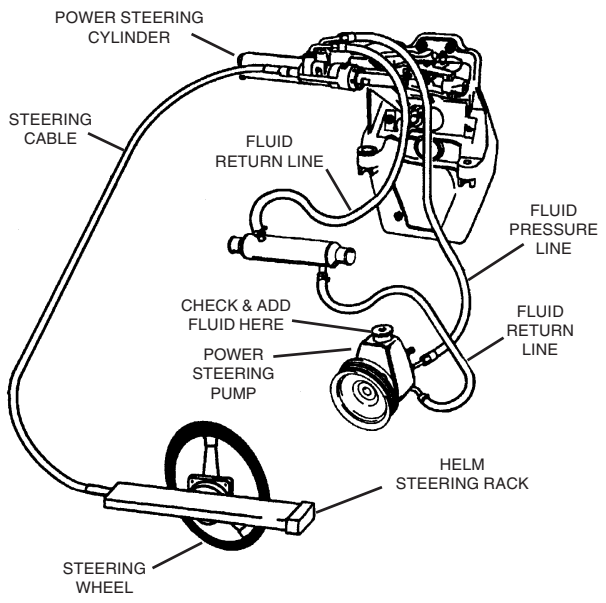
The steering system is an enclosed push-pull cable that is hydraulically assisted (power steering) at the stern drive end (Figure 3.9.1 & 3.9.2). THE CABLE AND ITS CONNECTIONS TO THE STEERING WHEEL AND TO THE OUT DRIVE MUST BE INSPECTED AT LEAST TWICE A YEAR BY YOUR SEA RAY DEALER. See section 8 of this manual for inspection, service and maintenance recommendations.

The power steering pump (Figure 3.9.1) fluid level MUST be checked every time prior to using the boat. Refer to the steering system information in your Owner's Packet.

⚠ WARNING

Failure of the steering system will cause loss of control of your boat. Any change in steering such as looseness, tightness, binding, etc., must be checked immediately by your Sea Ray dealer.

POWER STEERING SYSTEM
(FIG. 3.9.1)

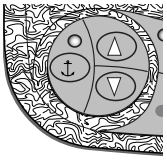


11. WINDLASS

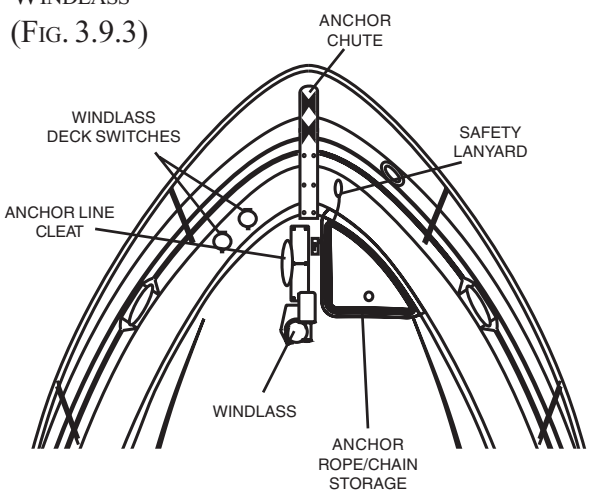
The windlass is wired to the 12 volt system through the 110 amp WINDLASS thermal breaker (See Fig. 6.11.1) located in the bilge on the forward component board.

The windlass facilitates the anchoring of your boat by automatically raising and lowering the anchor. To operate the windlass the WINDLASS power switch on the control station switch panel must be ON.

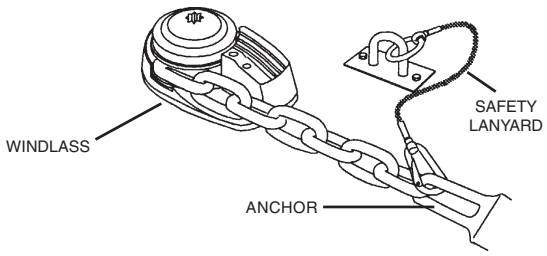
WINDLASS POWER & UP/DOWN SWITCHES (RIGHT SWITCH PANEL) (FIG. 3.9.2)



WINDLASS
(FIG. 3.9.3)



WINDLASS SAFETY LANYARD AND CHAIN
(FIG. 3.9.4)



NOTICE

It is important that the windlass clutch is tight for proper operation and safety. Periodically check the clutch and tighten if necessary.

To Tighten Clutch: With the anchor in the stowed position, tighten the windlass clutch by inserting the emergency handle into the clutch nut (see Fig. 3.10.1) and turn clockwise.

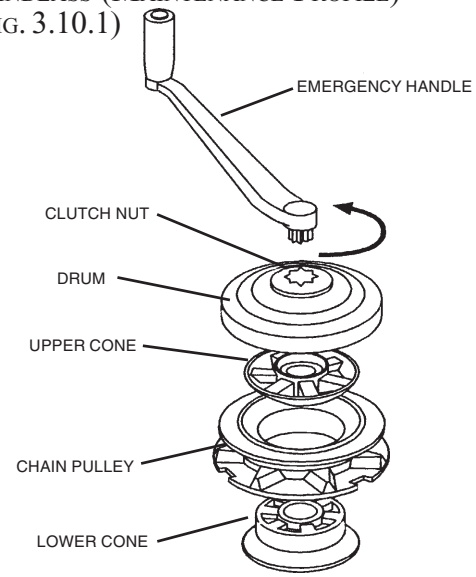
⚠ WARNING

Keep hands, feet, hair and loose clothing clear of moving parts. Entanglement may cause severe bodily injury (i.e. lose of fingers or toes).

A. To Operate from the Helm:

- Make sure that the safety lanyard is removed from the anchor chain.
- Turn the WINDLASS MAIN switch ON.
- Push the bottom of the WINDLASS CONTROL switch (located on the control station switch panel) to raise the anchor. To lower the anchor, push the top of the WINDLASS CONTROL switch.

Windlass (Maintenance Profile)
(Fig. 3.10.1)



B. To Operate from the Bow:

- Make sure that the safety lanyard is removed from the anchor chain.
- Lift protective cap on foot switches and depress UP or DOWN switch for the desired result.

C. To Operate Manually:

- Make sure that the safety lanyard (see Fig. 3.9.4) is removed from the anchor chain.
- Insert the emergency handle into the clutch nut (see fig 3.10.1)
- Turn handle clockwise to retrieve anchor.

D. Maintenance:

- Periodically check the motor and control box electrical connections, remove any residue and cover the connections with a small coating of grease.

⚠ DANGER

Make sure that the power is off before any work is performed on the windlass.

It is recommended at least once a year to disassemble the windlass (see Fig. 3.10.1) and remove any residue build-up.

- Using the emergency handle, unscrew the clutch nut by turning the handle counterclockwise.
- Remove the drum, upper cone, chain wheel and lower cone.
- Wash down with fresh water and remove any residue.
- Coat contact surfaces with a light film of lubricant.
- Reassemble the unit and tighten clutch by turning the handle clockwise.

REFER TO WINDLASS OPERATOR'S MANUAL IN YOUR OWNER'S PACKET FOR DETAILED OPERATING INSTRUCTIONS.

1. BILGE

A. FUEL & OIL SPILLAGE

Regulations prohibit discharging fuel or oily waste in navigable waters. Discharge is defined as any action which causes a film, sheen or discoloration on the water surface, or causes a sludge or emulsion beneath the water surface. A common violation is bilge discharge. Use rags or sponges to soak up fuel or oily waste, then dispose of it properly ashore. If there is much fuel or oil in the bilge, contact a knowledgeable marine service to remove it. Never pump contaminated bilge overboard.

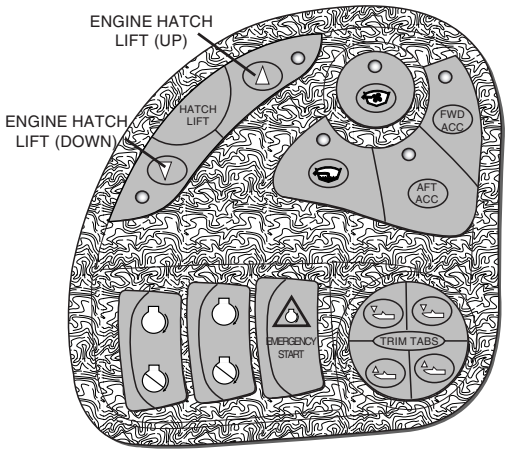
Fill fuel tank(s) less than rated capacity. Allow for fuel expansion.

B. ELECTRIC COCKPIT/ENGINE HATCH

Open the cockpit/engine hatch by pressing the ENGINE HATCH switch on the helm switch pad.

Note: The transom door has a magnetic switch built into it. The transom door must be opened completely and latched for the ENGINE HATCH switch to operate.

ENGINE HATCH SWITCHES
(FIG. 4.1.1)



POWER FAILURE & COCKPIT/ENGINE HATCH

In the event of power failure the engine hatch can be opened by removing the pins from the top electric actuator rams where they attach to the cockpit/engine hatch and then lifting the hatch. Practice this procedure several times to become familar with pin locations.

To Manually Lift Cockpit/Engine Hatch:

1. Have a 2x4 or similar object ready to prop up the hatch after it is lifted.

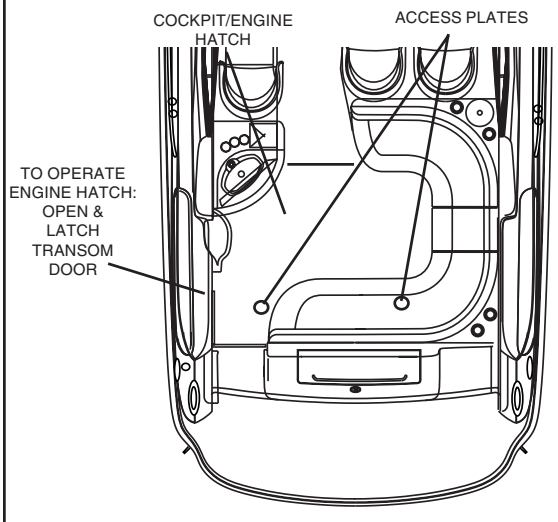
1. Open actuator access plates on the floor of the cockpit/engine hatch. (The starboard plate is under the aft seat.)

2. Reach inside and feel immediately to the left or right and find the pin.

3. Pull pin from actuator ram. Repeat on other actuator.

4. Manually lift the hatch. Prop up hatch with a 2x4 or similar object.

TRANSOM DOOR & ACTUATOR PIN ACCESS PLATES
(FIG. 4.1.2)



C. Drain Plug

⚠ DANGER

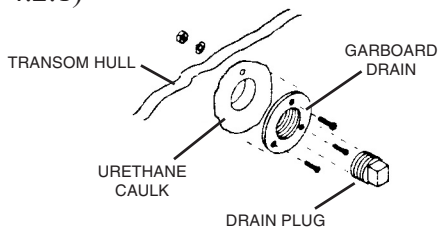
Install and tighten drain plug before launching boat.

Boat will sink if drain plug is not in place and tight.

The bottom of the engine compartment is called the "bilge". It is the lowest and inner part of the hull. Water and other liquids will collect here.

After removing your boat from the water, unthread the drain plug to drain the bilge (Figure 4.2.1).

Drain Plug
(Fig. 4.2.1)



D. Bilge Pumps

⚠ WARNING

SINKING HAZARD – Ensure the bilge pumps are operating properly.

⚠ CAUTION

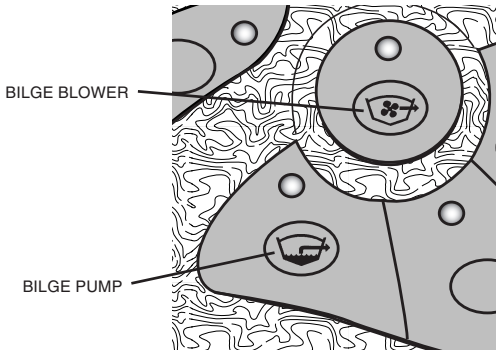
Run bilge pumps in the manual position only as long as necessary to remove water. Running bilge pumps dry can damage the pump motor.

A bilge pump and float switch are located in the bottom of the bilge (Figure 4.2.3). The bilge pump is manually activated from the switch panel located on the helm (Figure 4.2.2).

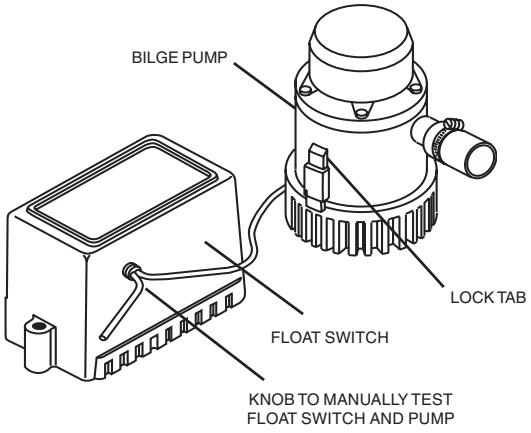
Before starting the engine, press the bilge pump switch so that the switch light comes ON. Make sure the pump is working by opening the engine compartment, listening to hear the pump running and check to see that liquid is being pumped out from the hull discharge (See Fig. 2.10.1). If the bilge has more liquid than normal, see Maintenance Section for locating and correcting the problem.

Except for checking the operation of the bilge pump using the ON position, leave the switch in the OFF (AUTO) position. In the OFF (AUTO) position, when the bilge liquid is deep enough to activate the float switch, the bilge pump turns on and pumps out the bilge liquid until the float switch drops and shuts off the pump.

Bilge Pump and Bilge Blower Switch
(Left Switch Panel) (Fig. 4.2.2)



Bilge Pump & Float Switch
(Fig. 4.2.3)



If the liquid level in the bilge is higher than normal and the bilge pump empties the bilge when you use the ON switch, either the breaker for the automatic bilge pump circuit has blown or the float switch is not operating properly. Have it checked immediately. If the ON switch does not operate the pump, DO NOT use the boat until the problem is corrected.

The emergency high water bilge pump and float switch are wired to the high water bilge alarm. Should the pump be activated by water in the sump, the alarm will sound. If alarm sounds, immediate attention to the engine room is required.

The bilge pump automatic circuit is protected by a breaker on the main DC breaker panel located in the engine compartment (See Fig. 6.7.1 & 6.11.2). The bilge pump manual circuit is protected by a breaker in the aft EIM box located in the engine compartment.

1. Maintenance

Frequently inspect the area under the float switches to ensure they are free from debris and gummy bilge oil. To clean, soak in heavy duty bilge cleaner for 10 minutes, agitating several times. Check for unrestricted operation of the float. Repeat the cleaning procedure if necessary.

Inspect the bilge pump intakes and keep them free of dirt or material which may impede the flow of water through the pump. To clean the pump strainer, depress the lock tabs on both sides of the pump and lift the pump motor.

Troubleshooting:

If water does not come out of discharge hose:

1. Depress the "BILGE PUMP" and "EMERGENCY BILGE PUMP" breakers on the main DC breaker panel located on the forward component board in the bilge (see Fig. 6.8.1) to ensure they have not tripped.

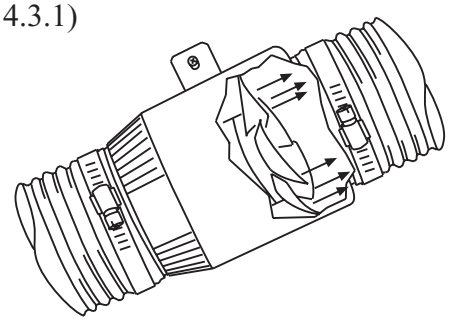
   Also, depress the "BILGE PUMP" breaker on the aft EIM also located on the forward component board in the engine compartment (see Fig. 6.11.1)
2. Remove the motor module to see if the impeller rotates with the power on.
3. Remove any debris that may have accumulated in the nozzle section or strainer base.
4. Check hose and connection on hull side for debris and proper connections.

E. Bilge Blowers

To prevent buildup of gasoline fumes to the explosive level in the engine compartment, the bilge blowers must be run for at least four (4) minutes before starting the engine and kept running at all times when the engine is running to insure that there will be adequate ventilation when you are moving slowly.

The bilge blower is protected by a breaker in the aft EIM box located in the engine compartment (See Fig. 6.7.1 & 6.11.2).

Bilge Blower
(Fig. 4.3.1)



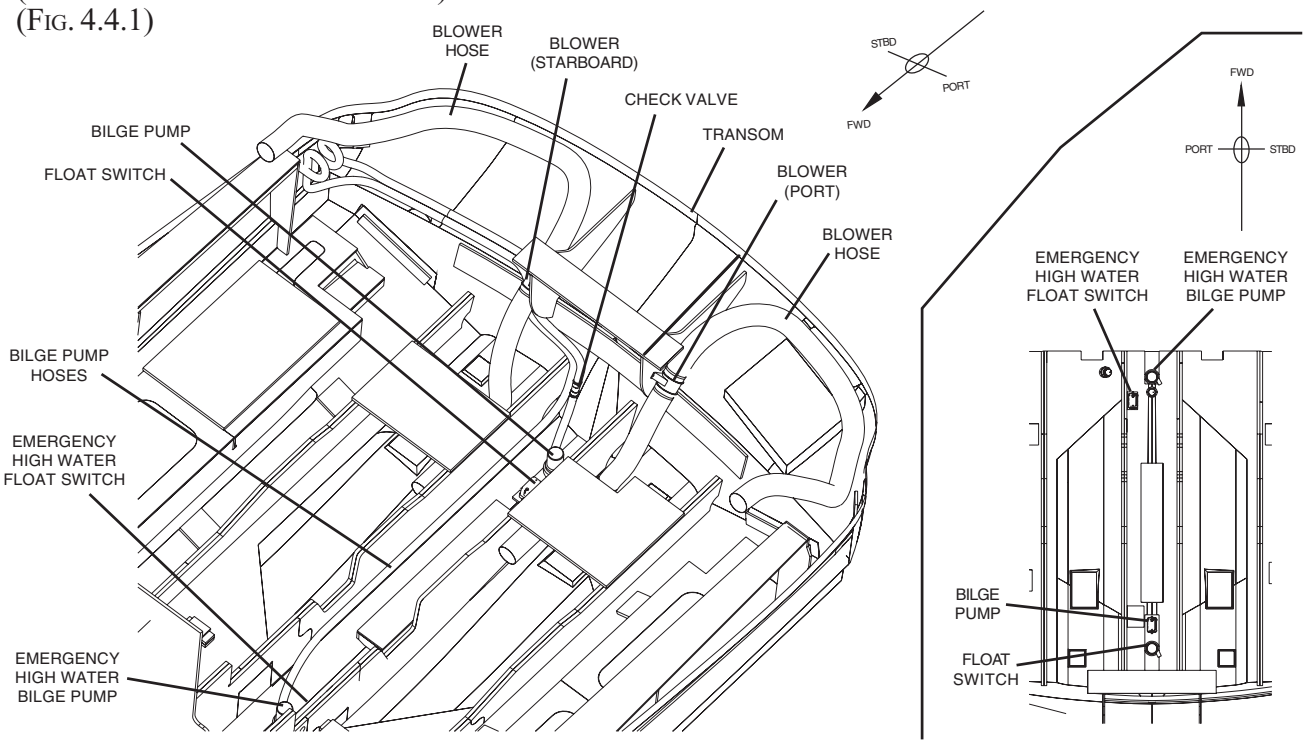
⚠ WARNING

EXPLOSION/FIRE HAZARD – Run blower at least four (4) minutes before starting engine or generator. Check bilge and engine compartment for fumes.

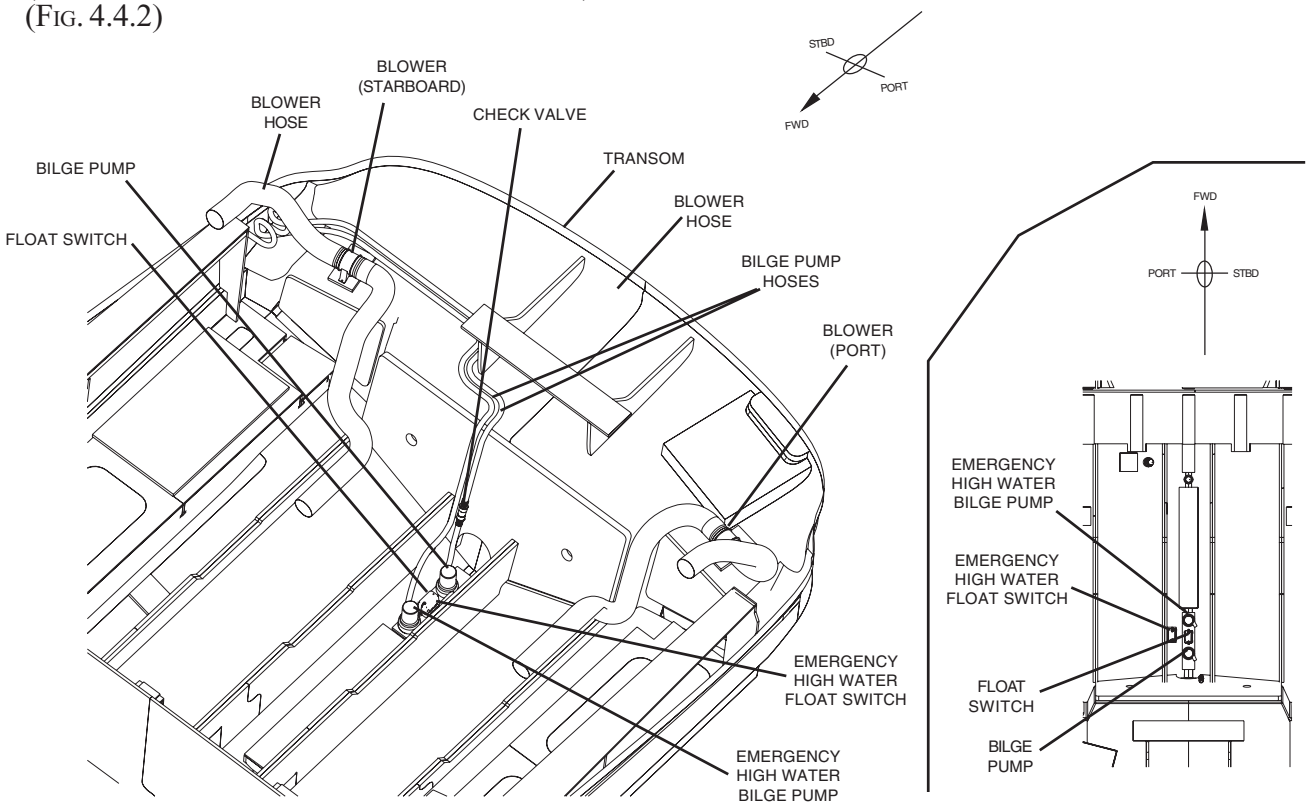
⚠ WARNING

Do not allow obstructions to interfere with bilge blower or ventilation intake operation. Engine performance may be adversely affected.

BILGE PUMP LOCATION & HOSE ROUTING / BLOWER LOCATION & HOSE ROUTING (WITH STANDARD V-DRIVE ENGINES) (FIG. 4.4.1)



BILGE PUMP LOCATION & HOSE ROUTING / BLOWER LOCATION & HOSE ROUTING (WITH OPTIONAL INBOARD/OUTBOARD ENGINES) (FIG. 4.4.2)

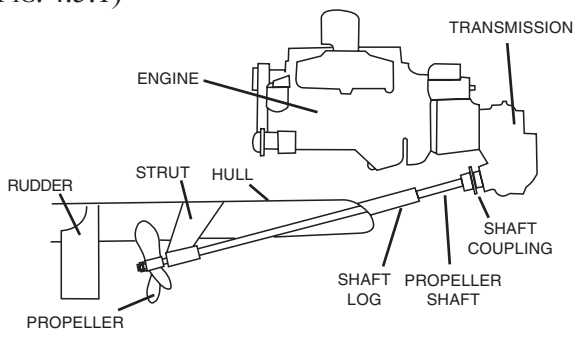


2. ENGINES

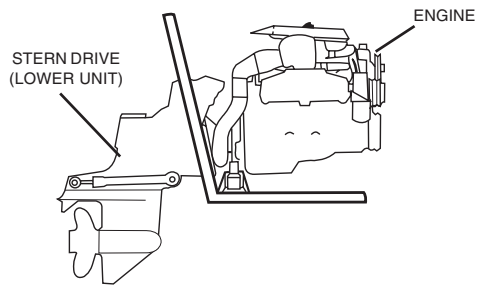
The engines on the 340 Sundancer® are the heart of your Sea Ray®. Proper attention to and maintenance of your engines will assure you of many hours of pleasurable, safe boating and will prevent unnecessary engine problems. You must, therefore, become thoroughly familiar with all aspects of the engine's proper operation outlined in the Engine Operator's Manual. A general maintenance program consists of proper lubrication, cleaning of fuel filters, fuel lines and air filters. **When washing down, or at any other time, take care that water does not enter the air inlets.** Water entering the air inlets when the engines are not operating may go directly into the cylinders, resulting in rust and possibly internal engine damage.

The engines are warranted directly by the engine manufacturer, not by Sea Ray®.

STANDARD INBOARD V-DRIVE (FIG. 4.5.1)



OPTIONAL STERN DRIVE (INBOARD-OUTBOARD) ENGINE (FIG. 4.5.2)



Sea Ray® strongly urges you to fully comply with the manual provided by the engine manufacturer. Follow the recommended maintenance and warranty schedule in your Engine Operator's Manual included in the owner's packet. Engine abuse or improper maintenance may adversely affect the claims made under the independent warranty provided by the engine manufacturer.

A. IMPACT TO STERN DRIVE (OPTIONAL ENGINES)

The stern drive can be damaged by impact, either while trailering or boating. To minimize the possibility of impact damage while trailering, keep the stern drive raised to the trailering position.

The hydraulic system used to raise and lower the stern drive can cushion impact and lessen damage from head-on impacts to the stern drive from underwater objects BUT ONLY when the boat is moving forward. There is no protection if the sterndrive is struck during reverse operation or from an angle when moving forward.

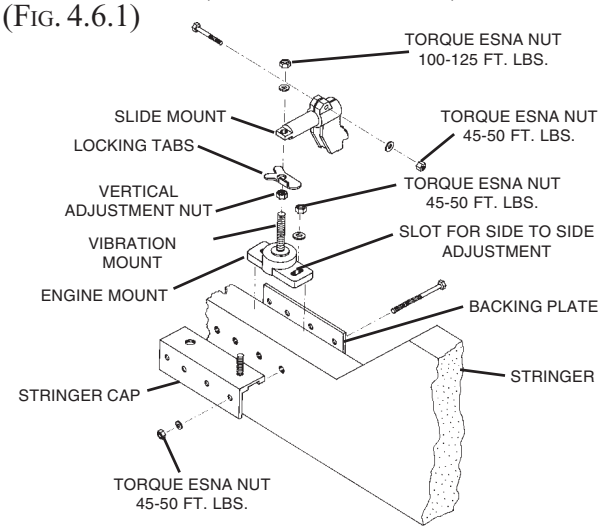
If you strike a submerged object, STOP THE ENGINE as soon as possible and examine the stern drive unit for damage. Even if no damage is visible, there could be internal problems or difficulty maneuvering. If you must use the boat after impact, run at the lowest speed possible.

3. ENGINE MOUNTS

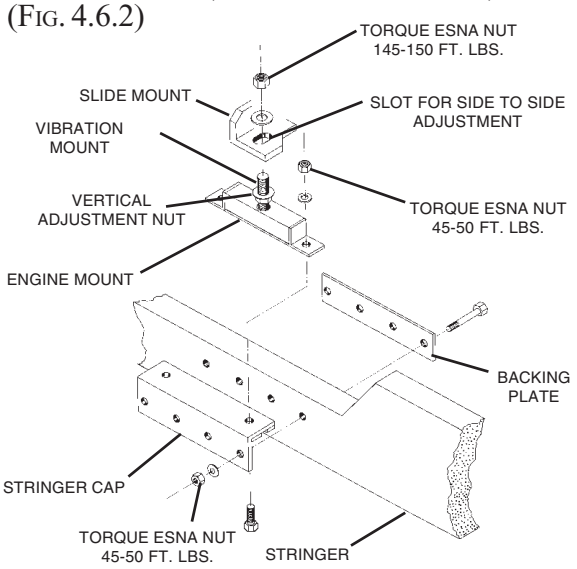
The adjustable type engine mounts permit adjustment sideways as well as vertically. Vertical adjustment nuts lock up or down on the threaded vertical stud, with a slot provided to allow side to side adjustment on the engine.

IMPORTANT: The large adjustment locknuts on these mounts must be tightened properly to retain alignment. It is also advisable to spray a protective coating on the studs and nuts to prevent corrosion.

ENGINE MOUNT (MOST GAS ENGINES) (FIG. 4.6.1)



ENGINE MOUNT (MOST DIESEL ENGINES) (FIG. 4.6.2)



4. MARINE GEARS

A. REDUCTION GEARS

A reduction gear reduces the rotating speed of the propeller shaft in relation to the engine RPM. This permits the use of a larger propeller while allowing the engine to attain its rated RPM, thereby increasing efficiency.

B. REVERSE GEARS

The reverse gear incorporates the clutch and controls the rotation of the propeller. The position of the clutch control or shifting lever indicates the motion which the clutch and reverse gear are transmitting. The center position of the lever indicates neutral. **Engine RPM should never exceed 1000 when engaging or disengaging the clutch. Higher RPM will result in unnecessary wear and shortened life of the unit, and perhaps breakage.**

Marine reverse gears are hydraulically operated, thereby making it imperative to periodically maintain and check oil level. If the correct oil level is not maintained, slippage occurs, causing damage to the clutch plates. Too much oil will cause foaming and erratic clutch operation. For additional information see the Engine Operator's Manual.

5. ENGINE EXHAUST SYSTEM (WITH STANDARD INBOARD V-DRIVE)

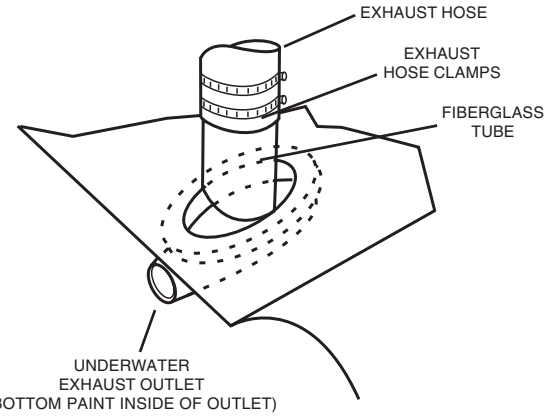
The underwater exhaust system (Figure 4.7.1) used with inboard V-drive engines is designed so that water from the raw water cooling system enters the exhaust system through elbows (engine side) where water and exhaust are mixed. Water and exhaust are then pumped overboard through muffler then the exhaust outlet tube and expelled under the boat. When operating at lower RPMs, there is insufficient exhaust pressure to utilize the underwater exhaust system and a conventional exhaust system with through-hull outlet fitting is provided as a bypass exhaust system for each engine. Make sure water is flowing from the exhaust outlets while the engines are operating. Prior to every boat use, examine the exhaust system fittings to ensure tightness.

⚠ WARNING

Hose clamps must be tight at all times to avoid exhaust leaks.

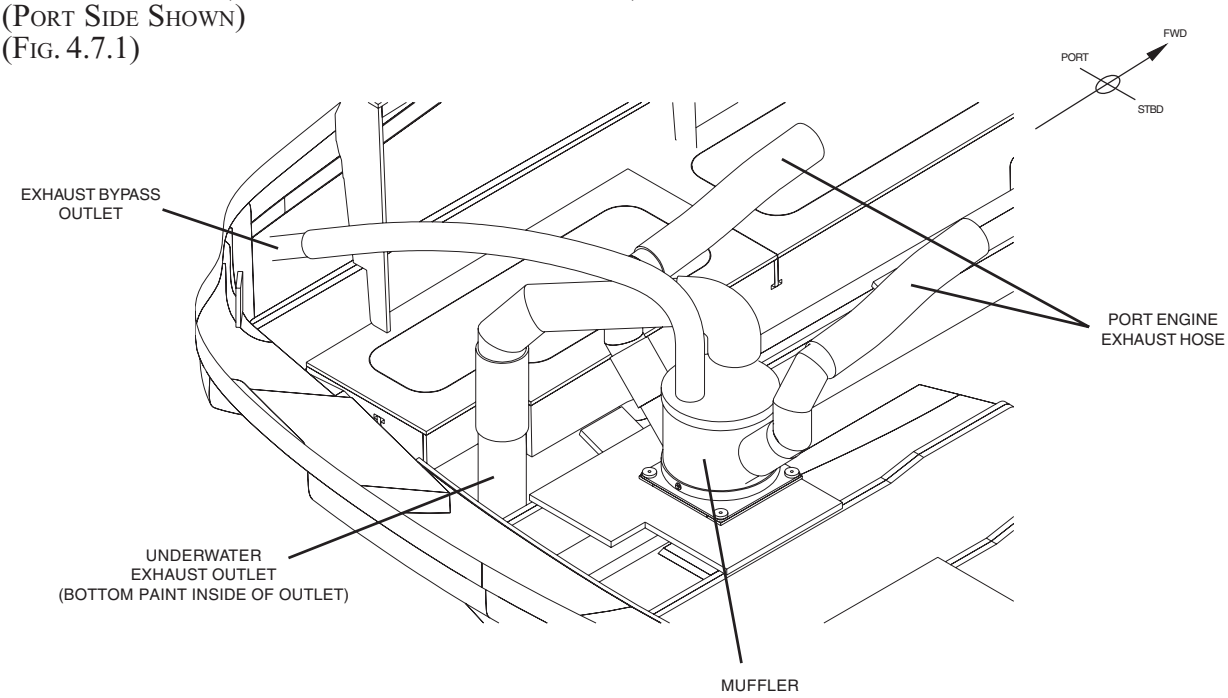
A drain plug is located on each muffler. When servicing or winterizing, remove the plug to drain the water out of each muffler. Replace the plug after all water has drained from the muffler.

UNDERWATRER EXHAUST OUTLET
(FIG. 4.7.2)



NOTE: EXHAUST HOSE ROUTING MAY BE DIFFERENT THAN THIS ILLUSTRATION DUE TO BILGE LAYOUT REQUIREMENTS FOR DIFFERING ENGINE AND EQUIPMENT OPTIONS.

EXHAUST SYSTEM (WITH STANDARD V-DRIVE ENGINE)
(PORT SIDE SHOWN)
(FIG. 4.7.1)



NOTE: EXHAUST HOSE ROUTING MAY BE DIFFERENT THAN THIS ILLUSTRATION DUE TO BILGE LAYOUT REQUIREMENTS FOR DIFFERING ENGINE AND EQUIPMENT OPTIONS.

6. ENGINE REMOVAL

Should the removal of an engine become necessary, **see your Sea Ray® dealer or an authorized service representative of the engine manufacturer.**

7. VIBRATION & CAUSES

Some vibration is to be expected in your boat because of the action of the engines and the propeller. But excessive vibration indicates conditions which must be promptly corrected to avoid damage. Contact your Sea Ray® dealer immediately if you are experiencing severe vibration. The following are some conditions which may cause vibrations.

A. FOREIGN OBJECT INTERFERING WITH PROPELLER ACTION

Weeds, ropes, fishing lines or nets can become wrapped around the propeller and/or shaft, causing vibration and loss of speed. Always stop and then reverse the propeller after going through a weedy area to unwrap and clear away any weeds which may have accumulated. Although reversing will sometimes help to unwrap lines and nets, they are difficult to remove without hauling the boat.

Always check for loose or trailing dock lines before getting underway. When towing a dinghy, remember that a long line may easily become entangled with the propeller when backing down.

B. BENT PROPELLER AND/OR SHAFT

A badly damaged or distorted propeller or shaft is an obvious cause of vibration. Even when the propeller appears to be perfect, make sure it has not been pulled off-center by the propeller key.

C. ENGINE AND SHAFT OUT OF ALIGNMENT

Although the shaft is properly aligned when it leaves the factory, after transit and after the boat has been in the water a few days, the alignment should be rechecked. The shaft coupling is the connecting point between the shaft and the engine and the alignment should be set at .005 or less. Refer to SHAFTS in this section of this Owner's Manual.

D. COUPLING OUT OF TRUE

Although an extremely unlikely condition, check the couplings if other efforts to correct the vibration fail. Check the engine half of the coupling (with dial indicator on the face) to see that it runs true with the shaft coupling. Also check the coupling keys. They must fit correctly to prevent forcing the couplings off center.

E. ENGINE PART HITTING BOAT STRUCTURE

Engines are flexibly mounted to reduce transmission of vibration to the hull structure. If some part of the engine, such as the oil pan, reverse gear or reduction gear housing, contacts a stringer, brace or part of the hull, vibration will result. The flexible shaft log allows a limited side motion of the shaft, but an excessive "whip" can cause the shaft to strike the sides of the shaft hole or the shaft log with resultant vibration.

F. OTHER POSSIBLE CAUSES

Other causes of vibration include the following: engine out of tune, a bent rudder, a worn strut bearing, a component of the exhaust system vibrating against the hull or improper contact between shaft taper and the propeller hub bore.

8. FRESH WATER COOLING SYSTEM (OPTION)

The fresh water cooling system is a closed system which helps protect engines from internal corrosion and provides more even distribution of engine temperature. **Change the coolant annually.**

A. COOLANT RECOMMENDATIONS:

The standard mixture of water and coolant is a mixture of 30% environmentally safe, non-toxic antifreeze and 70% water, which protects to 0°F (-18°C). This will allow the coolant to expand properly and maintain normal operating engine temperature. In colder climates, the coolant level should be increased to 50/50, which protects to -34°F (-37°C), for proper coverage. **To find engine coolant requirements for the specific engine on your boat, refer to your Engine Owner's Manual in the Owner's Manual Packet.**

9. UNDERWATER GEAR

A. PROPELLER GENERAL INFORMATION

Propellers should be free of nicks, excessive pitting and any distortions that alter them from their original design. Badly damaged propellers should be replaced, but those that are chipped, bent or merely knocked out of shape can be reconditioned by your marine dealer.

When doing extensive cruising, it is advisable to carry extra propellers aboard. Extra propellers can be stored on the optional propeller mounts in the engine room.

BASIC PROPELLER CHARACTERISTICS

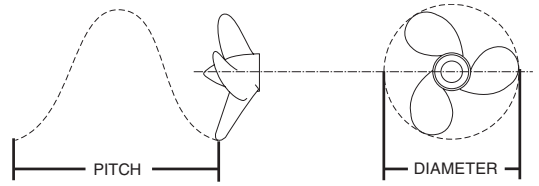
Propellers have two basic characteristics:

- Diameter
- Pitch.

Diameter is that distance measured across the propeller hub line from the outer edge of the 360° that is made by the propeller's blade during a single rotation. Pitch is that distance in inches that a propeller will travel if rotated one revolution without any slippage.

For example, a propeller with a 12-inch pitch, when rotated 360° would, theoretically, advance 12 inches through the water. Actually, no propeller applied to any boat is 100% efficient. No 12-inch pitch blade will, in a single rotation, advance a boat 12 inches. This variance is referred to as slippage.

PROPELLER PITCH AND DIAMETER
(FIG. 4.9.1)



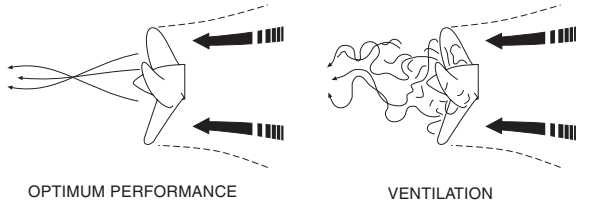
VENTILATION, ITS CAUSES AND CORRECTIONS

While often called "cavitation," ventilation is really a different effect. At times when a boat enters or leaves a sharp turn, the propeller seems to slip and lose thrust and the engine may over-speed. This problem is normally caused by air or aerated water entering the propeller. (A damaged propeller can also cause ventilation.) Ventilation can usually be corrected by one or more of the following:

1. Replace the damaged or incorrect propeller with the recommended one.
2. With stern drives, set the outdrive at a lesser trim angle (trim the unit downward).

CAVITATION, ITS CAUSES AND CORRECTIONS

PROPELLER VENTILATION
(FIG. 4.10.1)



Cavitation is a phenomenon that occurs in all propeller-driven craft under certain conditions. The surface of propeller blades are not perfectly flat, and as water is drawn through the blades to be discharged aft into the propeller's slip stream, the water flowing over the curved surface of the blade encounters areas of greater and less pressure.

In those areas of reduced pressure, air bubbles are formed. When they move out of the low pressure area these bubbles collapse. If they collapse while in contact with an object, such as part of the propeller blade or trim plane, the bubbles create such highly localized forces that they erode the surface of the object. In the case of the propeller, such damage is somtimes called a "burn". It may be caused by an irregularity in the propeller's leading edge, and it should be corrected by reconditioning the propeller or by replacement.

Cavitation is a normal occurrence in modern sport boats, and propeller inspection should be part of routine maintenance.

PROPELLER TORQUE AND ITS CORRECTION

Some of the more powerful motors create a considerable torque effect; that is, a twisting motion causing the boat to ride with one sheer lower than the other. This twisting reaction is caused by the direction of propeller rotation lifting one side of the boat. This causes an uneven drag, so that a boat's bow may tend to fall off in one direction or the other from the intended course given by the wheel.

Torque action may occur when maximum or close to maximum rated horsepower is applied. Any slight torque may be offset by shifting passenger or gear weight laterally to the high side of the boat.

COUNTER-ROTATING PROPELLERS

On twin engine yachts, one propeller turns in a clockwise direction while the other turns counterclockwise in order to maintain a straight course through the water.

When removing or replacing propellers, be sure to install the correct propeller on the correct drive.

COUNTER-ROTATING PROPELLERS
(FIG. 4.10.2)

B. PROPELLERS (WITH STANDARD INBOARD V-DRIVE ENGINES)

PROPELLER INSTALLATION:

For proper rotation, the installation of propellers on inboard engine boats requires the right hand propeller to be installed on the starboard side and the left hand propeller to be installed on the port side. Install in the following manner:

1. Inspect the key. It must be chamfered so that the corners of the key do not touch the keyway fillets (see Fig. 4.11.1, illustration #2).
2. Install the propeller on the shaft without the key in the keyway. Slide the propeller all the way on the shaft until it seats. Mark the shaft on the leading edge of the hub with a felt tip marker and remove the propeller.
3. Install the key in the keyway and slide the propeller on the shaft. If the key is not pinned, tap the key back slightly as the propeller slides up the taper. This will ensure that the propeller does not ride the key up the keyway end radius, thus forcing the propeller off-center. The propeller is properly seated if the hub is in the same position as previously marked.
4. Install a board (2 x 4) against the hub perpendicular to the keel and rotate the propeller clockwise until one blade rotates against the board. Do not put a board between the strut and the rudder. (Fig. 4.11.1, illustration #4.)
5. Install the large bronze prop nut on the propeller shaft and seat the propeller (Fig. 4.11.1, illustration #3) with the correct torque as listed on the table below.
6. Install the jam nut and torque to 100 ft. lbs.
7. Install the cotter pin.

NOTICE

If the jam nut and prop nut are installed properly, the propeller should not loosen. If you tighten both nuts holding only the propeller blade, the nuts could possibly thread back on the shaft to the cotter pin. It is important that the above procedure

Shaft Diameter	Thread Size	Prop Nut	Torque Ft. Lbs.	Jam Nut Torque Ft. Lbs.
1"	3/4"	Bronze	100-125	100
1 1/4"	7/8"	Bronze	150-175	100
1 1/2"	1 1/8"	Bronze	250-275	100
1 3/4"	1 1/4"	Bronze	275-300	100
2"	1 1/2"	Bronze	325-350	100
2 1/2"	1 3/4"	Bronze	400-425	100

PROPELLER INSTALLATION (FIG. 4.11.1)

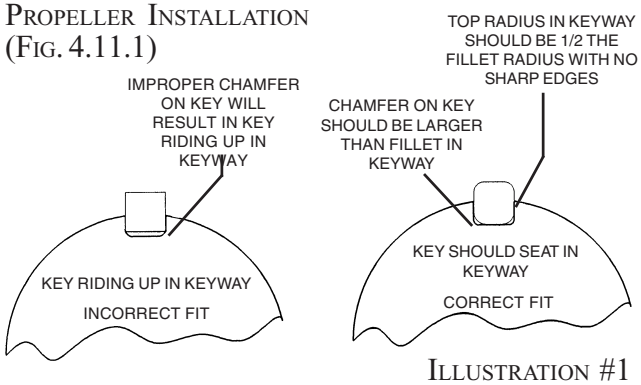

IMPROPER CHAMFER ON KEY WILL RESULT IN KEY RIDING UP IN KEYWAY
KEY RIDING UP IN KEYWAY
INCORRECT FIT
TOP RADIUS IN KEYWAY SHOULD BE 1/2 THE FILLET RADIUS WITH NO SHARP EDGES
CHAMFER ON KEY SHOULD BE LARGER THAN FILLET IN KEYWAY
KEY SHOULD SEAT IN KEYWAY
CORRECT FIT

ILLUSTRATION #1

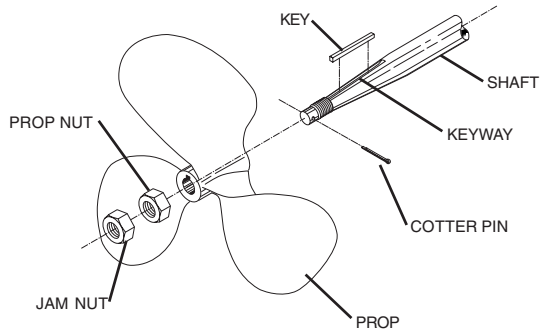


ILLUSTRATION #3

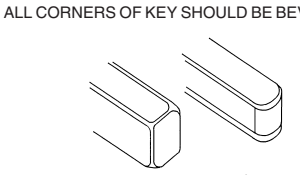


ILLUSTRATION #2

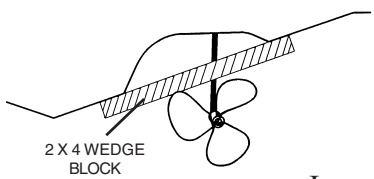


ILLUSTRATION #4

C. PROPELLERS (WITH OPTIONAL I/O STERN DRIVE ENGINE)

PROPELLER REMOVAL AND INSTALLATION

⚠ WARNING

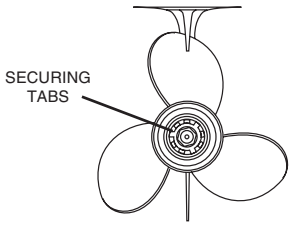
If engine is started during propeller maintenance, serious personal injury can occur.

Shut off engine, remove key, shift into neutral, and put tape over ignition switch key slot.

a. Shut off engine, remove key, shift into neutral and put tape over ignition switch key slot.

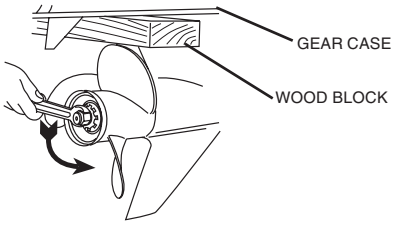
b. Straighten the bent tabs on the propeller nut retainer (Figure 4.12.1).

PROPELLER (FIG. 4.12.1)



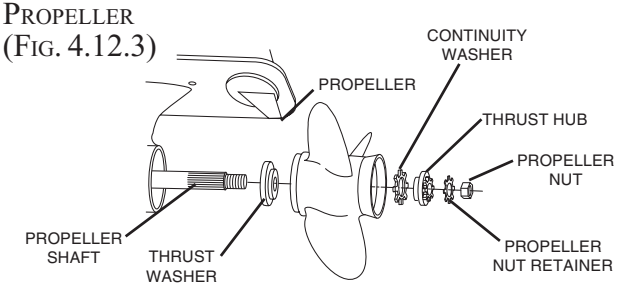
c. Place a block of wood between the gear case and propeller to stop propeller from rotating and remove propeller nut (Figure 4.12.2).

PROPELLER (FIG. 4.12.2)

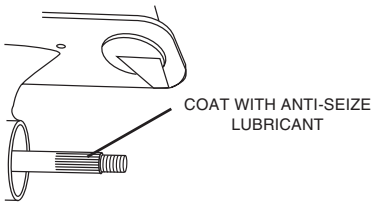


d. Remove the propeller nut retainer, the thrust hub and the continuity washer (Figure 4.12.3) and put them in a secure place. Pull the propeller straight off the shaft. Remove the thrust washer that is behind the propeller. If the propeller is seized to the shaft and cannot be removed by hand, special tools are needed. Have the propeller removed by an authorized dealer or trained mechanic.

PROPELLER (FIG. 4.12.3)



PROPELLER (FIG. 4.12.4)

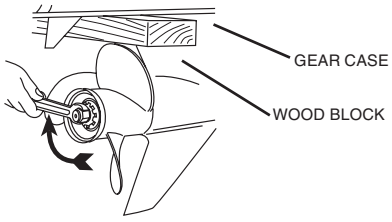


e. Coat the propeller shaft with an anti-seize lubricant (Figure 4.12.4).

f. Install the thrust washer, propeller, continuity washer, thrust hub, propeller nut retainer and the propeller nut onto the shaft (Figure 4.12.3).

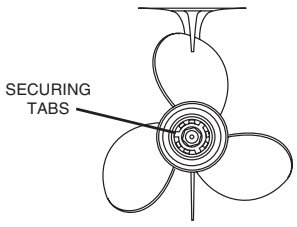
g. Place a block of wood between the gear case and the propeller (Figure 4.12.5) and torque the propeller nut to recommended manufacturer's specifications. The correct propeller nut torque is given in your Engine Operator's Manual in the Owner's Manual Packet.

PROPELLER (FIG. 4.12.5)



h. Secure the propeller nut by bending three (3) of the tabs of the propeller nut retainer into the thrust hub grooves (Figure 4.12.6).

PROPELLER (FIG. 4.12.6)

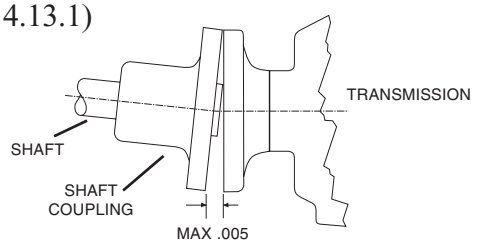


D. SHAFTS (WITH STANDARD INBOARD V-DRIVE ENGINES)

The shaft coupling is the connecting point between the shaft and the engine (Figure 4.13.1). The alignment should be set at a maximum of .005" (0.13mm). A slight misalignment will cause loss of power, excessive wear, noise and vibration and should not be tolerated. When checking for parallel coupling faces (the proof of proper alignment), use a feeler gauge not more than .003 to .005 of an inch thick (0.08 – 0.13mm).

With coupling faces brought together by hand – not bolted – the feeler gauge should be tightly gripped at all points around the edges of the couplings. Next, hold the engine coupling flange stationary and rotate the shaft coupling flange 90 degrees in either direction. The feeler gauge should still be tightly gripped at all points around the edges of the couplings.

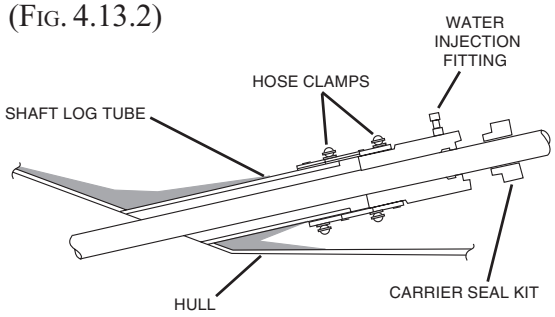
SHAFT MISALIGNMENT
(FIG. 4.13.1)



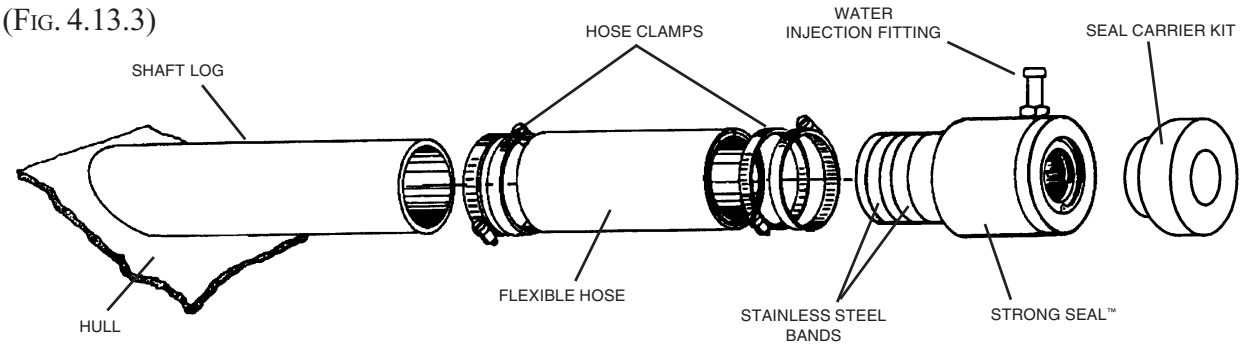
SHAFT LOG & STRONG SEAL™

The shaft log is a fiberglass tube which provides an opening through the bottom of the boat for the propeller shaft. The Strong Seal™ is connected to it by a short length of special flexible hose which serves to absorb normal shaft vibration. The Strong Seal™ prevents water from leaking around the shaft and into the boat. Shaft alignment and straightness must be correct to assure proper operation of the Strong Seal™. Refer to the Strong Seal™ information for the seal carrier kit in the Owner's Manual packet.

SHAFT LOG & STRONG SEAL™
(FIG. 4.13.2)



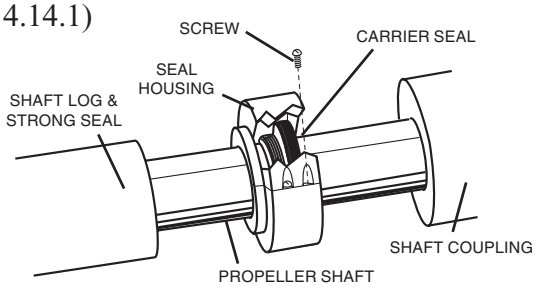
SHAFT LOG & STRONG SEAL™ ASSEMBLY
(FIG. 4.13.3)



E. CARRIER SEAL KIT (WITH STANDARD INBOARD V-DRIVE ENGINES)

Your 340 Sundancer® is equipped with spare carrier seals located on the port and starboard engine shafts. Seal failure can be corrected by replacing the seal with the spare seals provided.

CARRIER SEAL KIT
(FIG. 4.14.1)



TO REPLACE THE CARRIER SEAL:

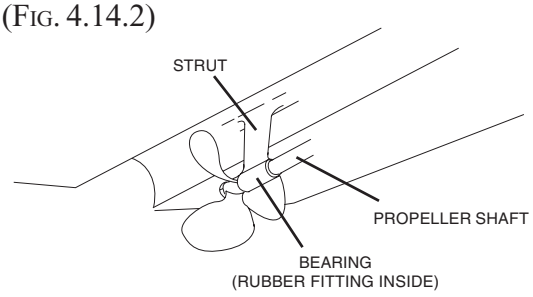
1. Clean any accumulated dirt and scale from the exposed shaft. MAKE SURE THERE ARE NO SHARP EDGES OR BURRS ON THE SHAFT.
2. Separate the two halves of the Carrier Seal Kit housing by removing the screws. If there are two lip seals in the carrier kit, move the forward most one forward on the shaft until out of the way.
3. Remove the retaining ring from the Strong Seal™ using a small screwdriver (for a spiral ring) or snap-ring pliers (for a snap ring). Work the retaining ring around the new lip seal and move the ring forward out of the way.
4. Re-assemble the empty Carrier Seal Kit housing onto the shaft just forward of the new lip seal with the small diameter facing aft. Leave the screws loose enough that the housing can move along the shaft. The Carrier Seal Kit housing is now ready to be used as a lip seal installation tool.
5. Push needle-nose pliers or a hook into the exposed body of the lip seal and pull it out of the Strong Seal™ housing. Cut the old seal off the shaft with wire cutters. BE CAREFUL NOT TO SCRATCH THE SHAFT.
6. Inspect and clean the inside of the Strong Seal™ housing and the newly exposed area of the shaft that was under the old lip seal.
7. Push the new lip seal and installation tool aft until the lip seal contacts the Strong Seal™ housing. Using a rubber mallet, tap the face of the installation tool until the lip seal is seated within the Strong Seal™ housing. You will know the lip seal is fully seated when the retaining ring groove is exposed.
8. Remove the Carrier Seal Kit housing from the shaft. Re-install the retaining ring into its groove in the Strong Seal™ housing.
9. If the Carrier Seal Kit came with two lip seals, position the remaining lip seal back onto a convenient location on the shaft at least 2" forward of the Strong Seal™. Re-assemble the Carrier Seal Kit housing around the lip seal with the smaller diameter facing forward. Tighten the screws and make sure the assembly is firmly secured on the shaft.

NOTE: As the Carrier Seal Kit is turning with the shaft and the Strong Seal™ is not, it is important that the two do not touch.

F. STRUT

The strut is the bronze casting fastened to the bottom of the hull to support and form a bearing for the propeller shaft. A replaceable rubber bearing is inserted to minimize wear and protect the shaft where it passes through the strut hub. During lay up periods, squirt castor oil into this bearing to keep it from freezing to the shaft. **Never use machine oil or grease on rubber bearing.** Periodically check all strut fastenings to assure that they are secure.

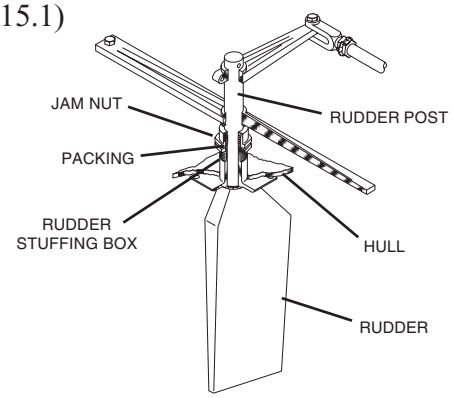
STRUT
(FIG. 4.14.2)



10. RUDDER & RUDDER STUFFING BOX (WITH STANDARD INBOARD V-DRIVE ENGINES)

The rudder is the vertical flat surface aft of the propeller that pivots about a vertical axis and changes the direction of the boat through the water. The rudder stuffing box prevents water from leaking into the boat where the rudder post enters the hull. Spot check for leaks before and after using your boat.

RUDDER & RUDDER STUFFING BOX
(FIG. 4.15.1)



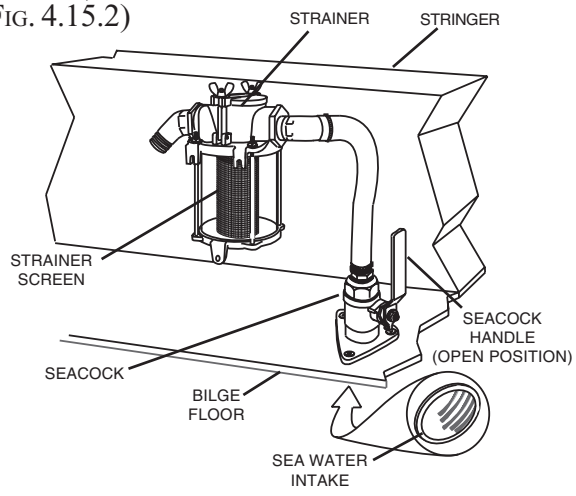
11. SEACOCKS & STRAINERS

Seacocks and strainers provide cooling water to the engines, generator and A/C units located throughout the bilge area.

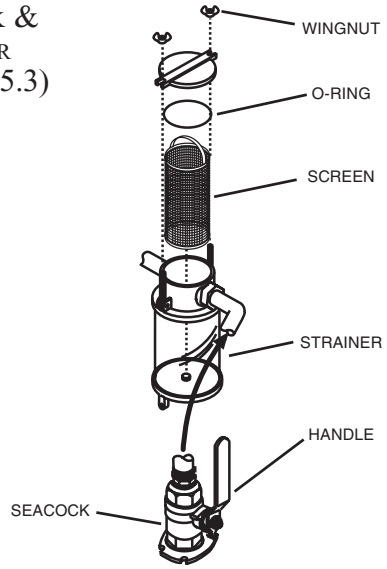
To open the seacock, turn the handle in line with water flow (vertically). To close, turn the handle against water flow (horizontally). The strainers should be inspected frequently and cleaned out when plugged. If operation of the air conditioning is excessive it is important that the A/C unit strainers are inspected more frequently than other strainers.

The seacock body should be inspected and lubricated annually.

SEACOCK & STRAINER INSTALLATION
(TYPICAL)
(FIG. 4.15.2)



SEACOCK & STRAINER
(FIG. 4.15.3)



⚠ CAUTION

As a safety measure, close all seacocks when leaving boat for any length of time to impede water ingress in the event of water hose failure.

NOTICE

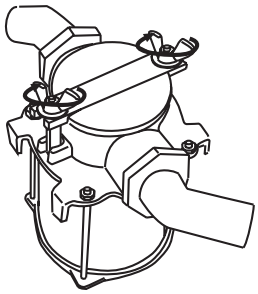
While being towed, you must close all main engine and generator engine seacocks to prevent water from being forced into the engine's exhaust and causing internal damage.

TO CLEAN THE STRAINER

1. Close the seacock by turning the handle against water flow (horizontally).

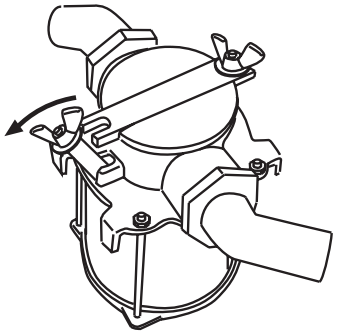
   NOTE: Some seacocks are equipped with locking tee handles which must be loosened before operating the handle.
2. Loosen wingnuts on top of strainer (see Fig. 4.16.1).

STRAINER MAINTENANCE
(FIG. 4.16.1)



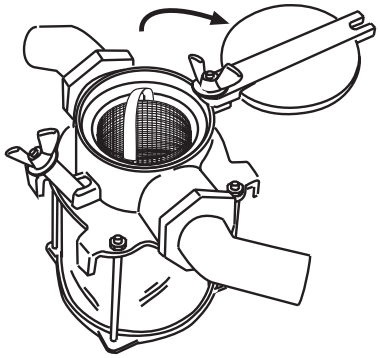
3. Release wingnut from slot in strainer cap by pulling forward (see Fig. 4.16.2).

STRAINER MAINTENANCE
(FIG. 4.16.2)



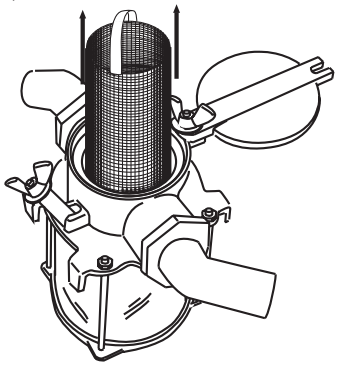
4. Rotate strainer cap clear of strainer housing (see Fig. 4.16.3)

STRAINER MAINTENANCE
(FIG. 4.16.3)



5. Remove and wash stainless steel screen (see Fig. 4.16.4)

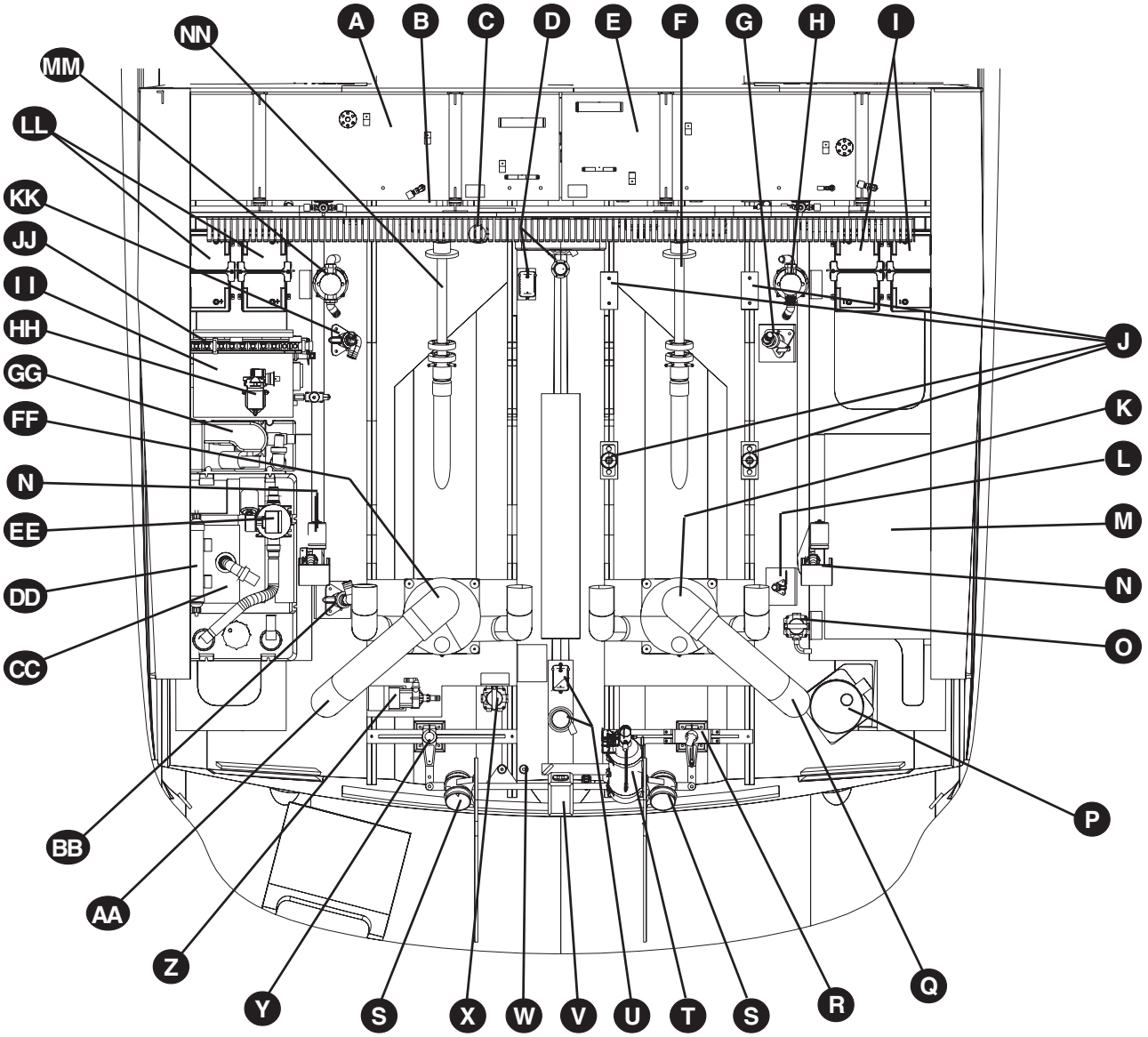
STRAINER MAINTENANCE
(FIG. 4.16.4)



6. Replace the screen, rotate cap into position on the housing, engage wingnut into slot and tighten both wingnuts.
7. Open the seacock by turning the handle with water flow (vertically) and check for leaks.

12. BILGE LAYOUT

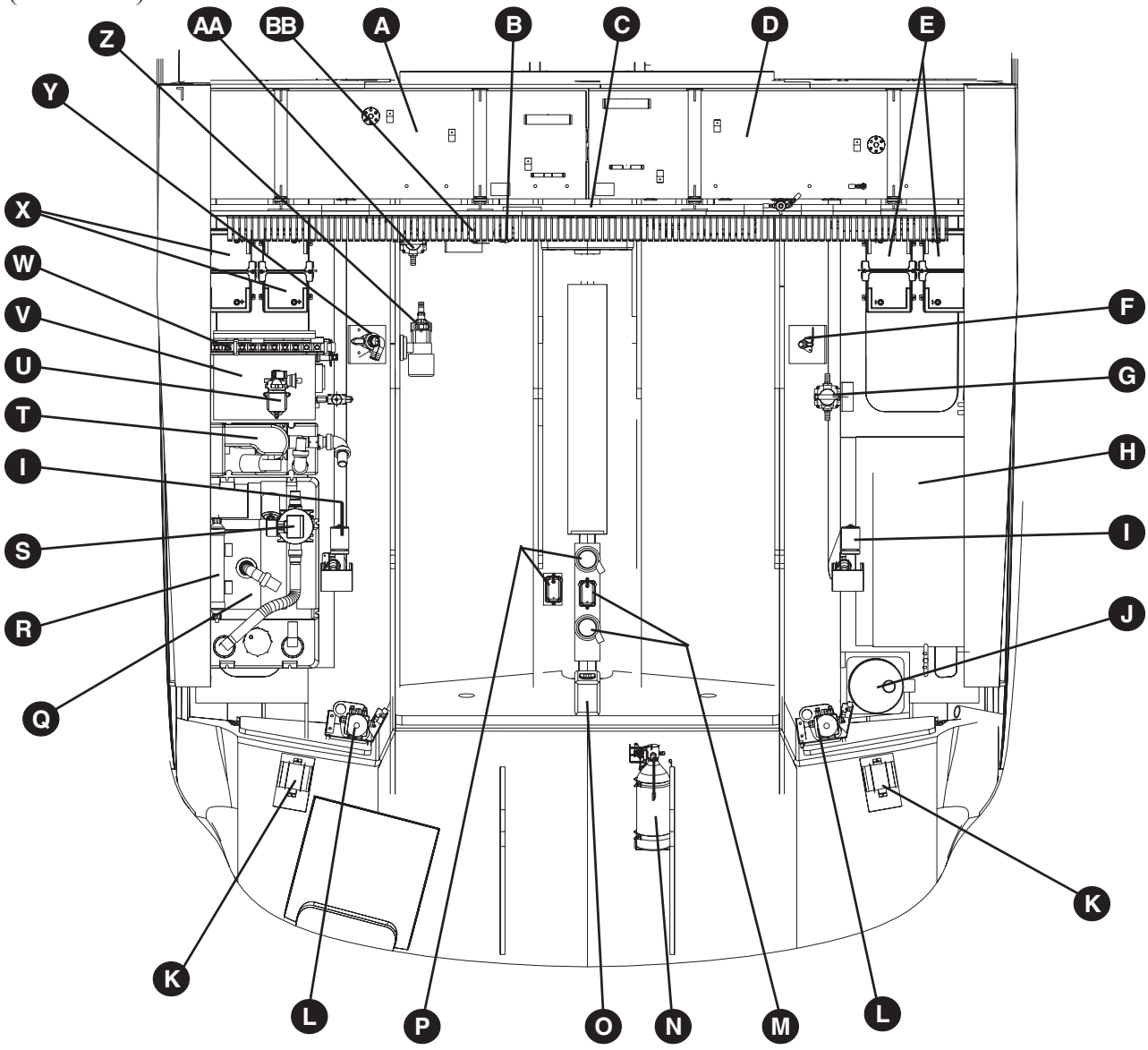
BILGE LAYOUT (WITH STANDARD V-DRIVE ENGINE)
(FIG. 4.17.1)



A	Fuel Tank Installation (Port)	N	Engine Hatch Actuator	BB	Head System Overboard Discharge Seacock (Option)
B	Bilge Component Board	O	Generator Strainer	CC	Head System Holding Tank
C	Speed Transducer	P	Generator Muffler	DD	Head System Vent Filter
D	Emergency High Water Bilge Pump & Float Switch (See Fig. 4.4.1)	Q	Underwater Exhaust (Starboard Engine)	EE	Head System Overboard Discharge Pump / Macerator (Option)
E	Fuel Tank Installation (Starboard)	R	Rudder Steering Assembly (Starboard) (With Autopilot Sensor)	FF	Engine Muffler (Port Engine)
F	Propeller Shaft Assembly (Starboard)	S	Bilge Blower (Port & Starboard)	GG	Head System Vacuum Generator
G	Engine Seacock (Starboard Engine)	T	Automatic Fire Extinguisher	HH	Water Pump & Filter
H	Engine Strainer (Starboard Engine)	U	Bilge Pump & Float Switch (See Fig. 4.4.1)	II	Water Heater
I	Batteries (Starboard)	V	Trim Tab Pump	JJ	Water System Manifold
J	Engine Mounts (Starboard) (Port Not Shown)	W	Air Conditioner Seacock	KK	Engine Seacock (Port Engine)
K	Muffler (Starboard Engine)	X	Air Conditioner Strainer	LL	Batteries (Port)
L	Generator Seacock	Y	Rudder Steering Assembly (Port)	MM	Propeller Shaft Assembly (Port)
M	Generator Location	Z	Air Conditioner Water Pump	NN	Prop Shaft Assembly (Port)
		AA	Underwater Exhaust (Port Engine)		

BILGE LAYOUT (CONTINUED)

BILGE LAYOUT (WITH OPTIONAL INBOARD/OUTBOARD ENGINES)
(FIG. 4.18.1)



- A Fuel Tank Installation (Port)
- B Speed Transducer
- C Bilge Component Board
- D Fuel Tank Installation (Starboard)
- E Batteries (Starboard)
- F Generator Seacock
- G Generator Strainer
- H Generator Location
- I Engine Hatch Actuator
- J Generator Muffler
- K Bilge Blower (Port & Starboard)
- L Stern Drive Power Trim Pump (Port & Starboard)
- M Bilge Pump & Float Switch (See Fig. 4.4.2)
- N Automatic Fire Extinguisher
- O Trim Tab Pump
- P Emergency High Water Bilge Pump & Float Switch (See Fig. 4.4.2)
- Q Head System Holding Tank
- R Head System Vent Filter
- S Head System Overboard Discharge Pump / Macerator (Option)
- T Head System Vacuum Generator
- U Water Pump & Filter
- V Water Heater
- W Water System Manifold
- X Batteries (Port)
- Y Head System Overboard Discharge Seacock (Option)
- Z Air Conditioner Water Pump
- AA Air Conditioner Strainer
- BB Air Conditioner Seacock

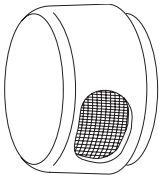
1. FUEL SYSTEM

Section 3 - Using Your Boat contains important fueling information. Take time to read all the fuel related information in the owner's manual.

The 340 Sundancer® standard gasoline fuel system consists of two fuel tanks with a total capacity of 225 gallon (851 liters), fuel tank vent, electric fuel valves, engine fuel supply line and fuel fill (Figure 5.1.2).

The fuel tank vent serves as a pressure/ vacuum release and safety overflow. The thru-hull fitting has a flame arrester, making it imperative that you keep the screen clean and in excellent repair.

FUEL VENT WITH SCREEN (FIG. 5.1.1)



Replace the screen immediately if it becomes damaged or displaced. Periodically check the vent to assure that it is not clogged. (Figure 5.1.1).

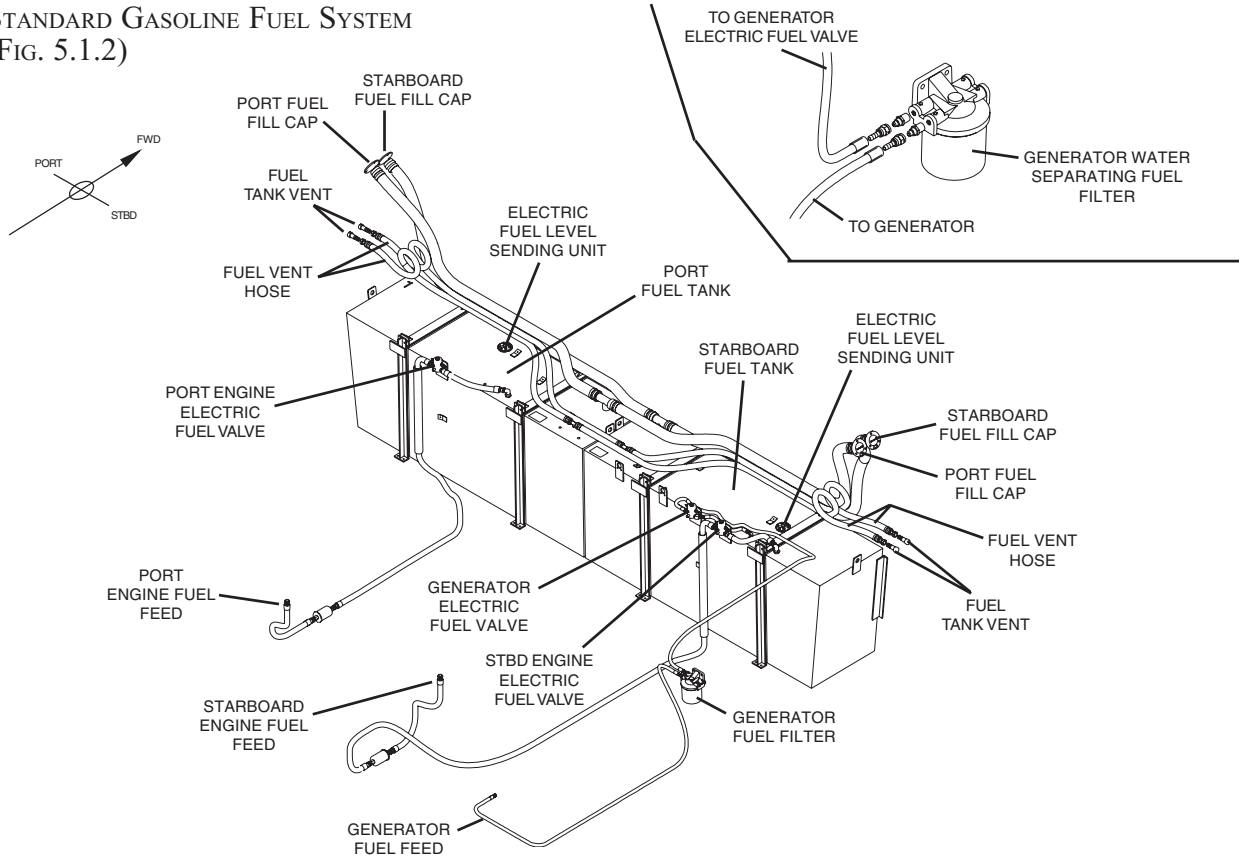
The fuel pick-up at the fuel tank has an electric fuel valve to prevent fuel from siphoning out in the event of fuel line failure.

Fill both fuel tanks from one side of the boat. Each side of the boat is fitted with two fuel fill plates, one for the port tank, one for the starboard tank.

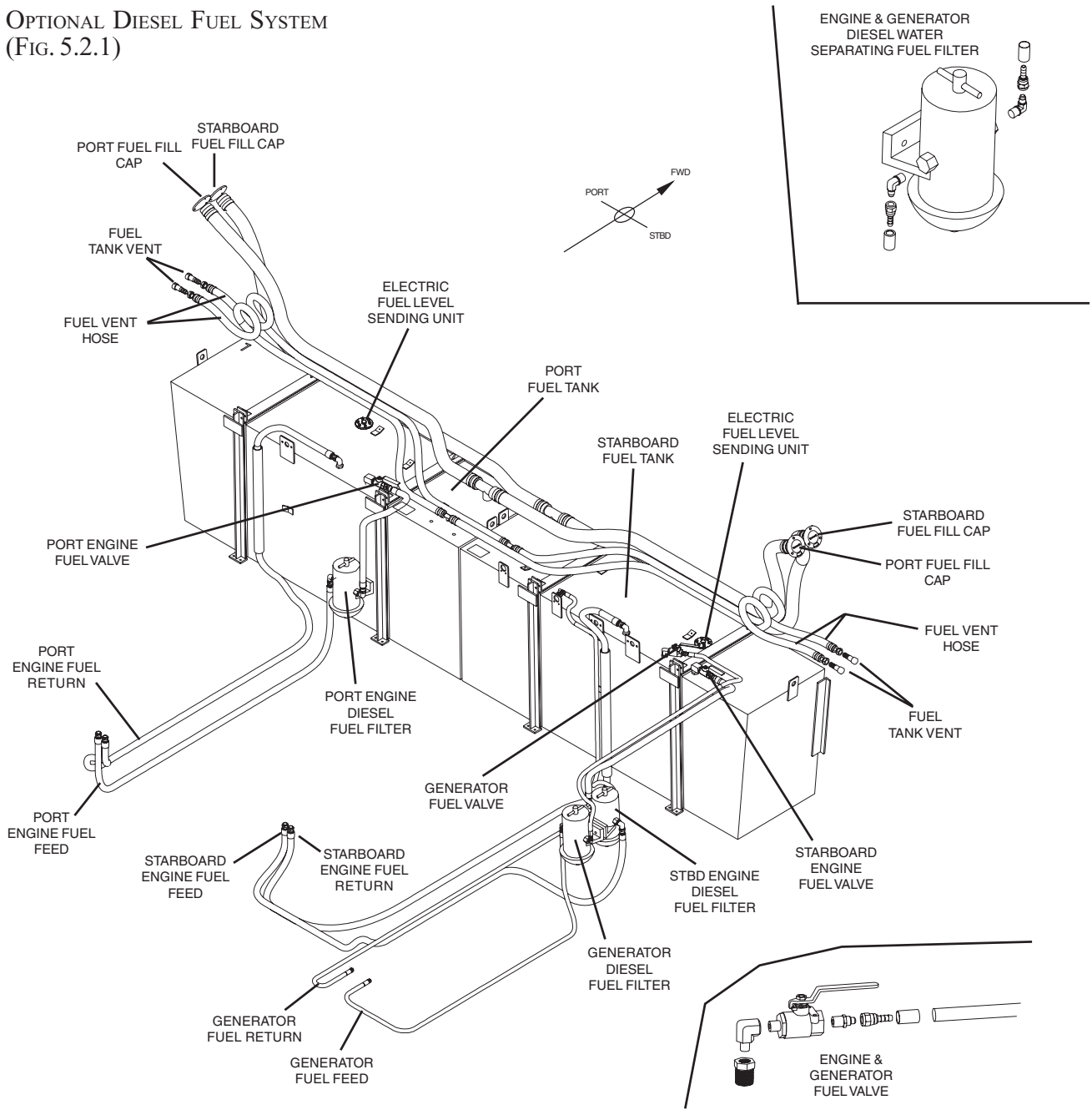
⚠ CAUTION

Never start an engine until you are certain that fuel fumes are not present in the engine compartment or elsewhere in the boat.

STANDARD GASOLINE FUEL SYSTEM (FIG. 5.1.2)



OPTIONAL DIESEL FUEL SYSTEM (FIG. 5.2.1)



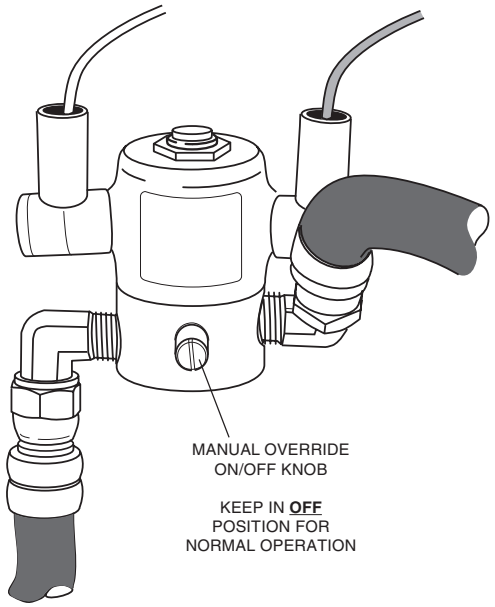
A. ELECTRIC FUEL VALVES (GASOLINE)

The electric fuel valves are wired to the ignition switch. When the ignition is turned ON the valve opens, when the ignition is turned OFF the valve closes. The manual override knob on the side of the valve should be left in the OFF position at all times.

In the event of an electrical malfunction, the valve can be opened and closed manually by turning the manual override knob.

The electric fuel valve is installed in-line on the fuel hose between the fuel tank the engines and generator.

ELECTRIC FUEL VALVE (FIG. 5.3.1)



B. DIESEL FUEL SYSTEM (WITH DIESEL ENGINE OPTION)

The diesel fuel system consists of two fuel tanks with a total capacity of 225 gallon (851 liters), fuel tank vent, shut-off valve, engine fuel supply and return line, fuel filters and fuel fills (Figure 5.2.1).

C. FUEL FILTER (DIESEL)

Primary and secondary fuel filters are located on your Sea Ray® to help keep the fuel as clean as possible. Primary fuel filters are the Racor® water separating fuel filters installed in the engine compartment (Figure 5.3.1). The secondary fuel filters are located on the engine and should be replaced in accordance with the Engine Owner's Manual.

NOTE: Use of any methanol, gasohol or alcohol based fuel additive will damage the fuel filter.

REFER TO THE ENGINE OPERATOR'S MANUAL FOR MORE DETAILED INFORMATION.

2. FUEL FILTER MAINTENANCE (DIESEL)

A major cause of poor starting or power loss is the result of a clogged filter element or a fuel system air leak. Check that the filter lid and drain plug are properly tightened.

Inspect or drain the collection bowl of water daily.

A. TO DRAIN WATER:

1. Shut down the engine.
2. Loosen the T-handle on the top lid to break the vacuum within the filter (see Fig. 5.4.1).
3. With a suitable collection container in place, remove the drain plug and allow water and contaminants to drain. (see Fig. 5.4.2).
4. Replace the drain plug and, if necessary, prime the filter by removing the lid (see Fig. 5.4.3) and filling the filter with clean fuel.
5. Replace the lid and tighten the lid T-handle by hand only. Do not overtighten.

Replace the filter element at regular intervals or if a power loss is detected.

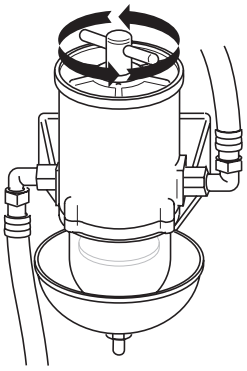
B. TO REPLACE THE FILTER:

1. Shut down the engine.
2. Remove the lid .
3. Remove the old rubber lid seal and dispose of the old seal properly.
4. Apply a coating of clean fuel or motor oil to the rubber lid seal supplied with the new element.
5. Place the new seal in position on the lid.
6. Remove the filter element by holding the molded handle and slowly pulling upward with a twisting motion.
7. Insert the new filter element with a slow downward twisting motion.
8. Fill the filter with clean fuel, then replace the lid. Tighten the lid T-handle by hand only. Do not overtighten.
9. Start the engine and check for any leaks.
10. Correct any leaks with the engine shut down.

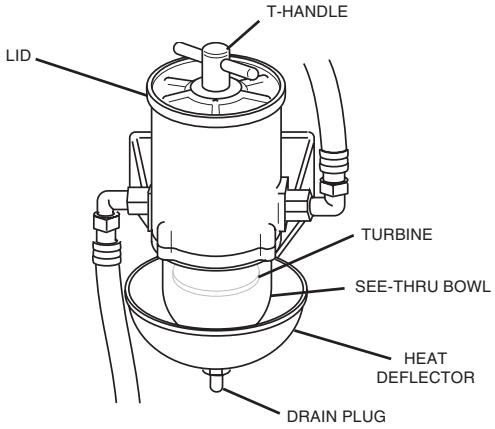
It is recommended that spare filter elements be carried aboard as contaminated fuel can easily plug a filter.

REFER TO THE ENGINE OPERATOR'S MANUAL FOR MORE DETAILED INFORMATION.

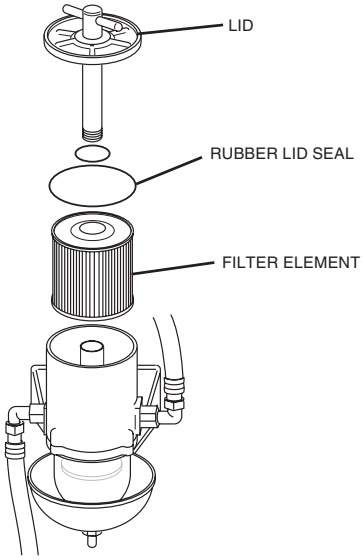
RACOR® FUEL FILTER MAINTENANCE
(FIG. 5.4.1)



RACOR® FUEL FILTER MAINTENANCE
(FIG. 5.4.2)



RACOR® FUEL FILTER MAINTENANCE
(FIG. 5.4.3)



3. FUELING PRECAUTIONS

Certain precautions must be carefully and completely observed every time a boat is fueled, even with diesel fuel. Diesel fuel is nonexplosive but it will burn.

⚠ WARNING

CALIFORNIA PROPOSITION 65

Diesel engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects and other reproductive harm.

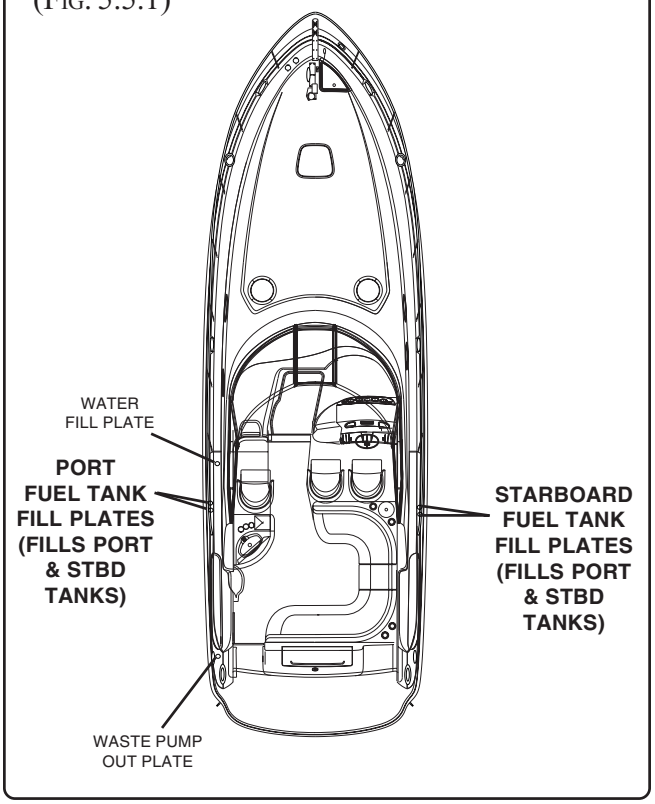
A. GENERAL:

- Fuel during daylight.
- Check fill plate label to ensure fuel is placed only in fuel tank. Fuel fill plates are located on the port and starboard sides of the transom (see Fig. 5.5.1).
- Avoid spills.
- Know your fuel capacity and consumption. Record the amount of fuel used since your last fill up, and compute the engine's hourly fuel usage. As a fuel gauge backup check, deduct the average hourly fuel usage from fuel tank capacity.
- Observe the "Rule of Thirds": one-third fuel for trip out, one-third for return and one-third for reserve.
- Allow an additional 15 percent fuel reserve when operating in rough seas.

B. BEFORE & DURING FUELING – CHECKLIST:

- Fire extinguisher – close at hand.
- Mooring – boat tied securely to fueling pier.
- Crew – at least one knowledgeable person present.
- Passengers – unnecessary people off the boat.
- Engines – stopped.
- Electrical equipment, including blowers – power off.
- Windows, doors, hatches – closed.
- Smoking material – extinguished.
- Inboard tanks – grounded.
- Filler pipe – marked GAS or DIESEL.
- Fuel nozzle – in contact with filler pipe to prevent static sparks.
- Fill level – fill less than rated capacity of tank; allow for fuel expansion.
- Trim – fuel weight distributed equally.

FUEL FILL LOCATION
(FIG. 5.5.1)


WATER FILL PLATE
PORT FUEL TANK FILL PLATES (FILLS PORT & STBD TANKS)
STARBOARD FUEL TANK FILL PLATES (FILLS PORT & STBD TANKS)
WASTE PUMP OUT PLATE

C. AFTER FUELING – CHECKLIST:

- Windows, doors, hatches – open.
- Sniff test – if fuel fumes remain, operate blowers until fumes are gone.
- Fuel tank – secure filler cap.
- Spills – wipe; dispose of rags ashore.

1. ELECTRICAL SYSTEM

A. DIRECT CURRENT (DC)

The 12 volt direct current (DC) electrical system (similar to that in your car or truck) derives it's power from the batteries. Batteries are kept charged by the engine-driven alternator or the battery charger/converter which must be powered by shore power or the generator. The battery voltage is indicated by the voltmeters on the helm panel and on the cabin DC distribution panel. The negative terminal of the battery is attached to the main negative bus.

Ask your dealer for a careful analysis of DC power needs on your boat. It may be necessary to add batteries or auxiliary charging methods to supply adequate power for any additional accessories you wish to add.

BATTERIES

⚠ DANGER

DO NOT USE JUMPER CABLES IN THE ENGINE COMPARTMENT.

They can cause an explosion from sparks.

⚠ DANGER

A battery will explode if a flame or spark ignites the free hydrogen given off during charging.

Never use an open flame or strike sparks in the battery area.

The battery installed in your boat has been selected for it's ability to furnish starting power based on engine starting requirements, as well as it's ability to power the DC accessories attached to the electrical system. See page 6.5 for the recommended batteries for your boat.

⚠ CAUTION

To prevent arcing or damage to the alternator, always disconnect battery cables before doing any work on the engine's electrical system.

To remove the battery cables:

1. Turn off all items drawing power from the battery.
2. Turn the battery switch to the OFF position (Battery switch is optional equipment on some models).
3. Remove the negative cable first, then the positive cable. To replace the cables, first replace the positive cable, then the negative.

BATTERY MAINTENANCE

- Check the fluid levels in the cells approximately every 4 weeks, and weekly in summer and hot zones.
- The fluid level must be between the lower and upper markings.
- Replenish only with distilled water. Do not use metal funnel.
- Coat battery terminal clamps with silicone grease. Keep batteries clean and dry.

Battery life is shortened if it is drained to zero charge before recharging. It is recommended that a battery not be discharged more than 50 percent. If the battery does become run down, recharge it as soon as possible.

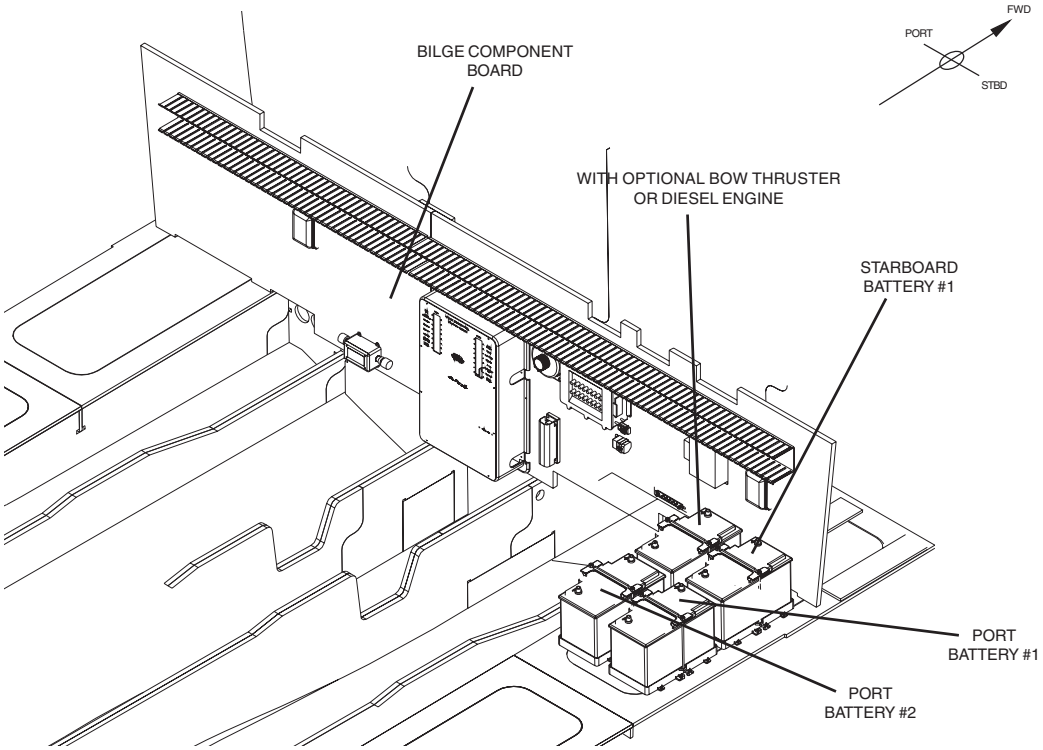
Running the engine to recharge the battery may not be effective. The alternator only creates charging power at higher engine speeds, so simply idling or trolling will not generate enough power to recharge the battery.

If you need to charge a battery, use only a battery charger designed to charge automotive/marine batteries. Use charger only when batteries are disconnected from the boat's electrical circuit. Follow the charger instructions.

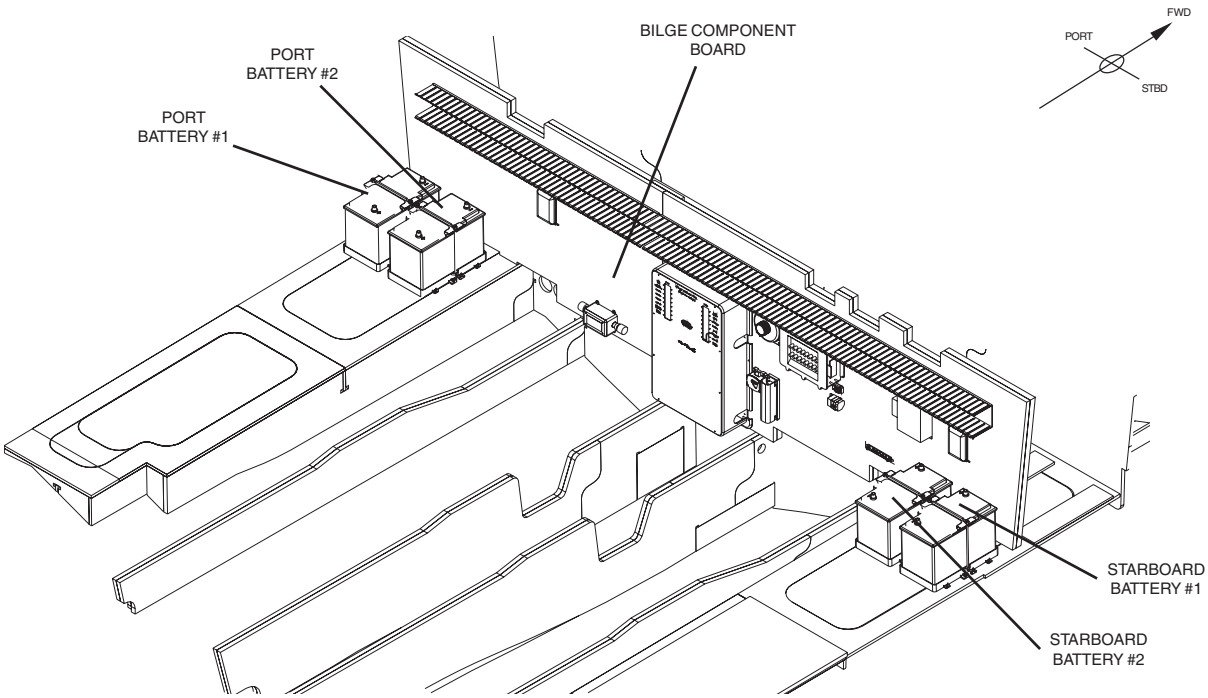
If the boat is equipped with dockside power and an AC/DC converter/battery charger, keep it on when shore power is available. This will keep the batteries properly charged and allow use of the DC powered equipment on board without draining the battery.

If your boat will not be used for several weeks or more, and there is no shore power hookup, remove the batteries from the boat and connect them to a charger.

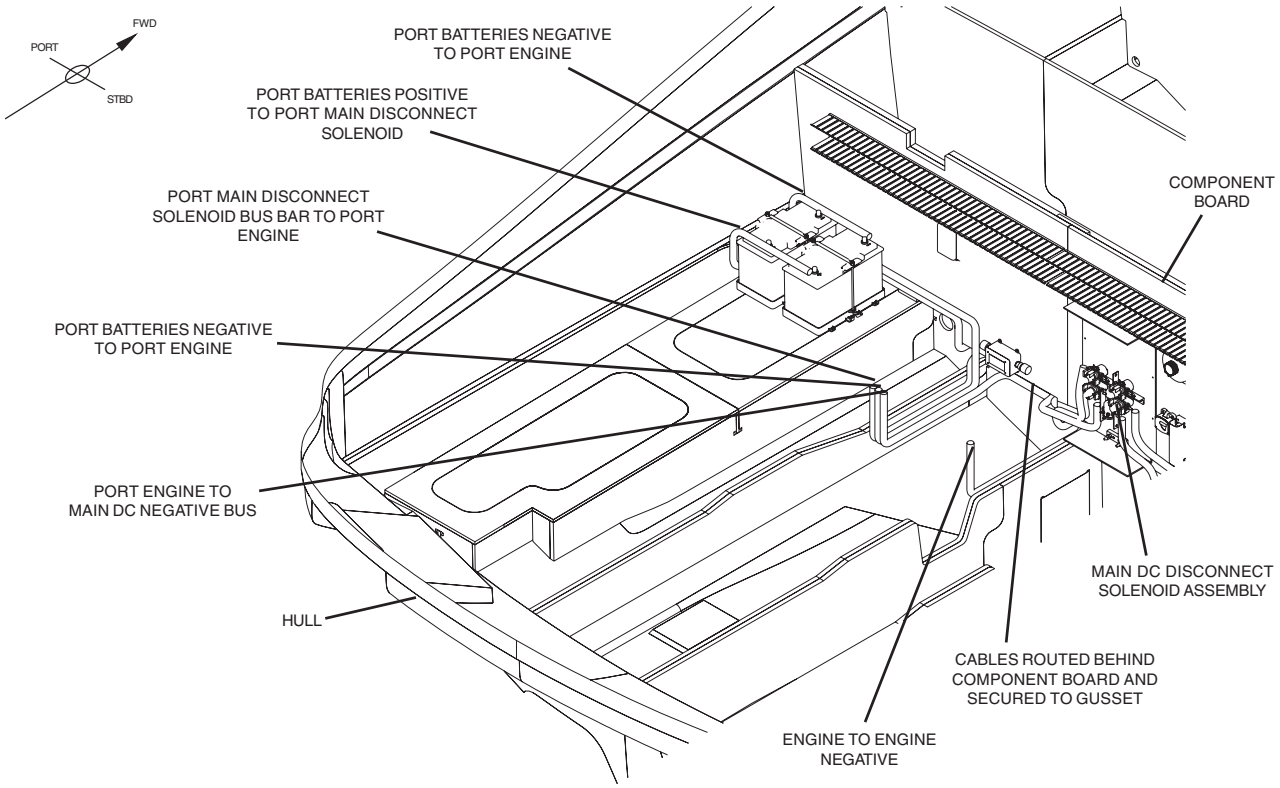
BATTERY INSTALLATION (WITH STANDARD INBOARD V-DRIVE ENGINES AND NO GENERATOR) (FIG. 6.2.1)



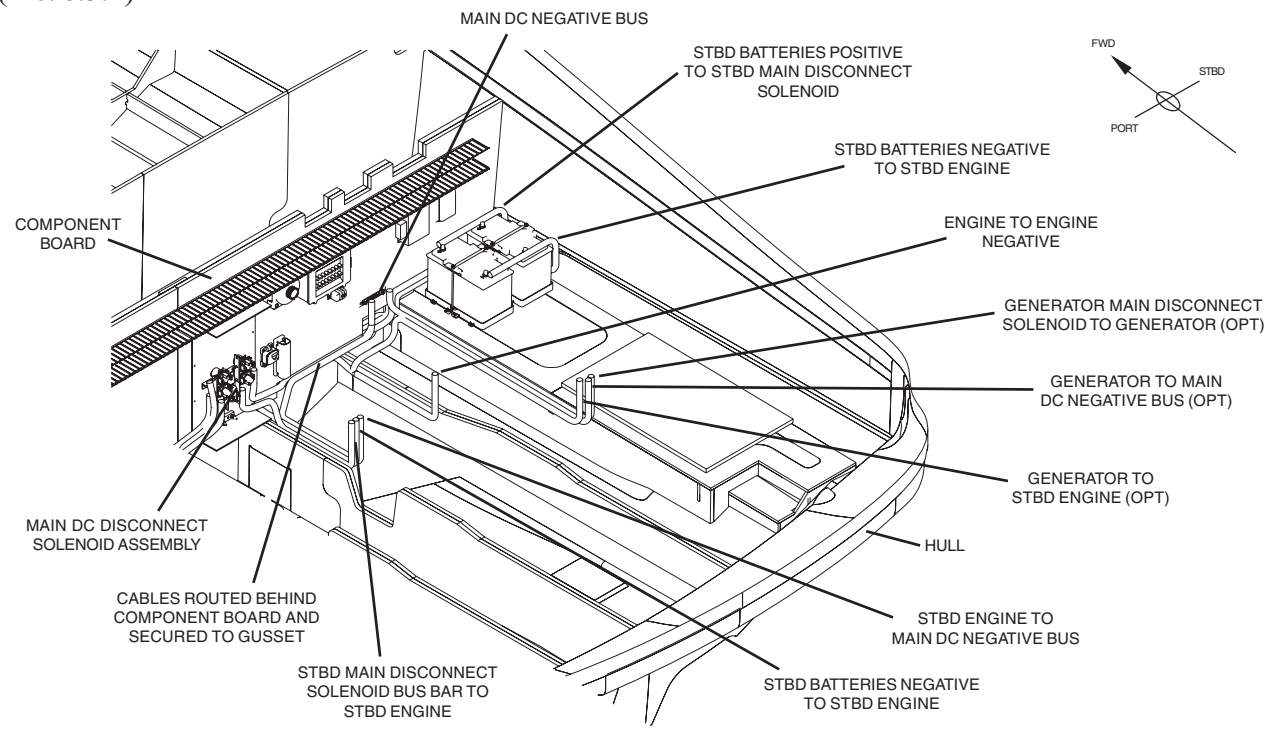
BATTERY INSTALLATION (WITH STANDARD INBOARD V-DRIVE ENGINES WITH GENERATOR) (FIG. 6.2.2)



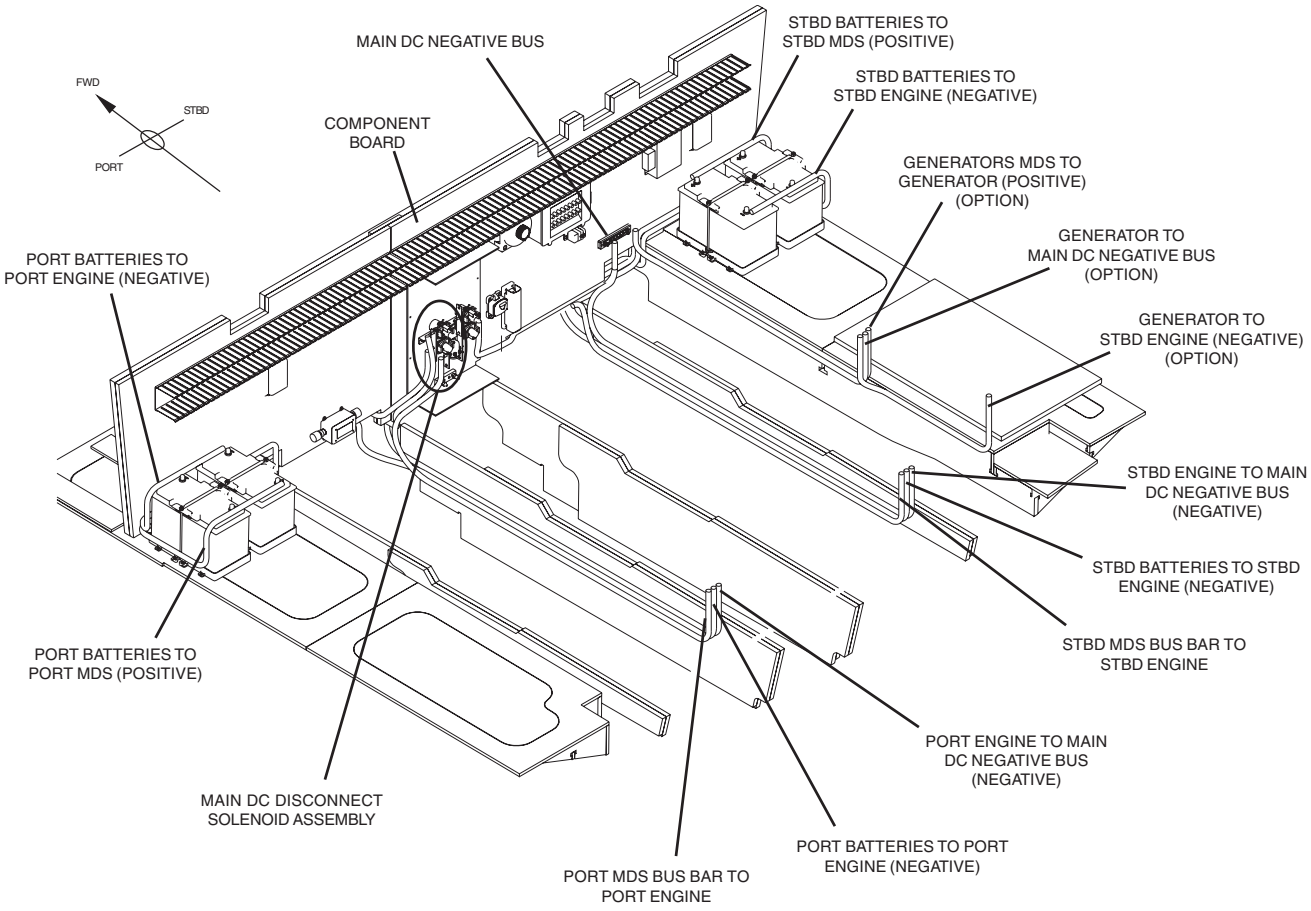
BATTERY CABLE ROUTING (WITH STANDARD INBOARD V-DRIVE ENGINES) (PORT VIEW) (FIG. 6.3.1)


FWD
PORT
STBD
PORT BATTERIES NEGATIVE TO PORT ENGINE
PORT BATTERIES POSITIVE TO PORT MAIN DISCONNECT SOLENOID
PORT MAIN DISCONNECT SOLENOID BUS BAR TO PORT ENGINE
PORT BATTERIES NEGATIVE TO PORT ENGINE
PORT ENGINE TO MAIN DC NEGATIVE BUS
HULL
COMPONENT BOARD
MAIN DC DISCONNECT SOLENOID ASSEMBLY
CABLES ROUTED BEHIND COMPONENT BOARD AND SECURED TO GUSSET
ENGINE TO ENGINE NEGATIVE

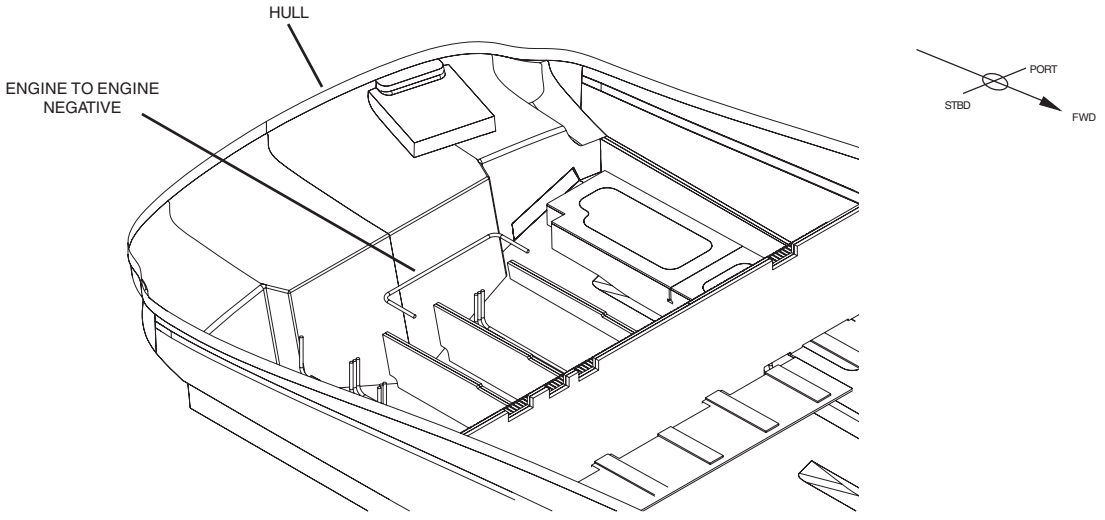
BATTERY CABLE ROUTING (WITH STANDARD INBOARD V-DRIVE ENGINES) (STARBOARD VIEW) (FIG. 6.3.2)


MAIN DC NEGATIVE BUS
STBD BATTERIES POSITIVE TO STBD MAIN DISCONNECT SOLENOID
FWD
STBD
PORT
STBD BATTERIES NEGATIVE TO STBD ENGINE
COMPONENT BOARD
ENGINE TO ENGINE NEGATIVE
GENERATOR MAIN DISCONNECT SOLENOID TO GENERATOR (OPT)
GENERATOR TO MAIN DC NEGATIVE BUS (OPT)
GENERATOR TO STBD ENGINE (OPT)
MAIN DC DISCONNECT SOLENOID ASSEMBLY
HULL
CABLES ROUTED BEHIND COMPONENT BOARD AND SECURED TO GUSSET
STBD ENGINE TO MAIN DC NEGATIVE BUS
STBD MAIN DISCONNECT SOLENOID BUS BAR TO STBD ENGINE
STBD BATTERIES NEGATIVE TO STBD ENGINE

BATTERY CABLE ROUTING (WITH OPTIONAL INBOARD OUTBOARD ENGINES) (PORT VIEW) (FIG. 6.4.1)


FWD
STBD
PORT
MAIN DC NEGATIVE BUS
STBD BATTERIES TO STBD MDS (POSITIVE)
STBD BATTERIES TO STBD ENGINE (NEGATIVE)
COMPONENT BOARD
GENERATORS MDS TO GENERATOR (POSITIVE) (OPTION)
GENERATOR TO MAIN DC NEGATIVE BUS (OPTION)
PORT BATTERIES TO PORT ENGINE (NEGATIVE)
GENERATOR TO STBD ENGINE (NEGATIVE) (OPTION)
STBD ENGINE TO MAIN DC NEGATIVE BUS (NEGATIVE)
STBD BATTERIES TO STBD ENGINE (NEGATIVE)
STBD MDS BUS BAR TO STBD ENGINE
PORT BATTERIES TO PORT MDS (POSITIVE)
PORT ENGINE TO MAIN DC NEGATIVE BUS (NEGATIVE)
MAIN DC DISCONNECT SOLENOID ASSEMBLY
PORT BATTERIES TO PORT ENGINE (NEGATIVE)
PORT MDS BUS BAR TO PORT ENGINE

BATTERY CABLE ROUTING (WITH OPTIONAL INBOARD OUTBOARD ENGINES) (STARBOARD VIEW) (FIG. 6.4.2)



B. Recommended Batteries

The following table describes the recommended marine cranking batteries to install in your boat. All batteries should be of the same type, age & rating.

Application	Group	Volts	CCA*	Reserve	Qty.
Engines	31	12	800	200	4

*COLD CRANKING AMPS

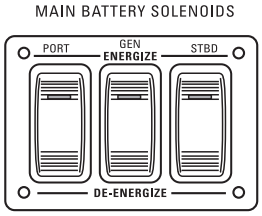
RECOMMENDED BATTERY:
DOUGLAS BATTERY TYPE: 31DCM, ITEM NUMBER: 989 OR EQUIVALENT
DIMENSIONS: 13" x $6^{13}/_{16}$" x $10^{1}/_{16}$"

C. Battery Switch

The battery switch controls the delivery of DC power from the batteries to the engines and all equipment, lights and accessories using DC power. The battery switches are located on the cabin DC power distribution panel and in the engine room on main DC distribution panel.

NOTE: For safety and convenience the following items are not shut off by the battery switches: bilge pumps, sump pumps, blower, stereo memory, systems monitor and battery charger inputs. These items need constant power to perform their task. This allows the bilge pump to operate any time excess fluid accumulates in the bilge, which can occur when the boat is docked and unattended. The entire remaining DC system is turned off with the battery switch.

Battery Switches (Fig. 6.5.1)



BATTERY SWITCHES LOCATED ON CABIN DC POWER DISTRIBUTION PANEL AND ENGINE ROOM MAIN DC DISTRIBUTION PANEL

2. Ignition Protection

All electrical components in the engine compartment must be ignition-protected to avoid the possibility of creating sparks in a gasoline environment.

⚠ DANGER

GASOLINE VAPORS CAN EXPLODE

Use ONLY Marine-rated parts to replace such items as starters, distributors, alternators, generators, etc.

Do not use automotive parts for these components or any jumper cables because they are not ignition-protected and could cause a fire or explosion.

Protective terminal covers, such as rubber boots on electrical connections, must be in place when engine is operating or when working in the engine compartment.

Jumper cables are not ignition-protected. DO NOT USE jumper cables in the engine compartment. The engine compartment may accumulate dangerous explosive gasoline fumes/vapors and hydrogen gas from batteries being charged. A spark produced when connecting a jumper cable can cause an explosion.

3. Breakers and/or Fuses

If you need to replace a fuse or breaker, **use only the same amperage as the original.** It is recommended that you carry spare fuses and breakers. See pages 6.6, 6.8 & 6.10 for the proper breaker and/or fuse sizes.

If a fuse or breaker is replaced with one of lower amperage, it will not be sufficient to carry the electrical load of the equipment it is connected to and will cause nuisance fuse failure or breaker tripping.

⚠ WARNING

Use of higher amperage fuses or breakers is a fire hazard.

Use fuses and breakers having the same amperage rating as the original or as specified.

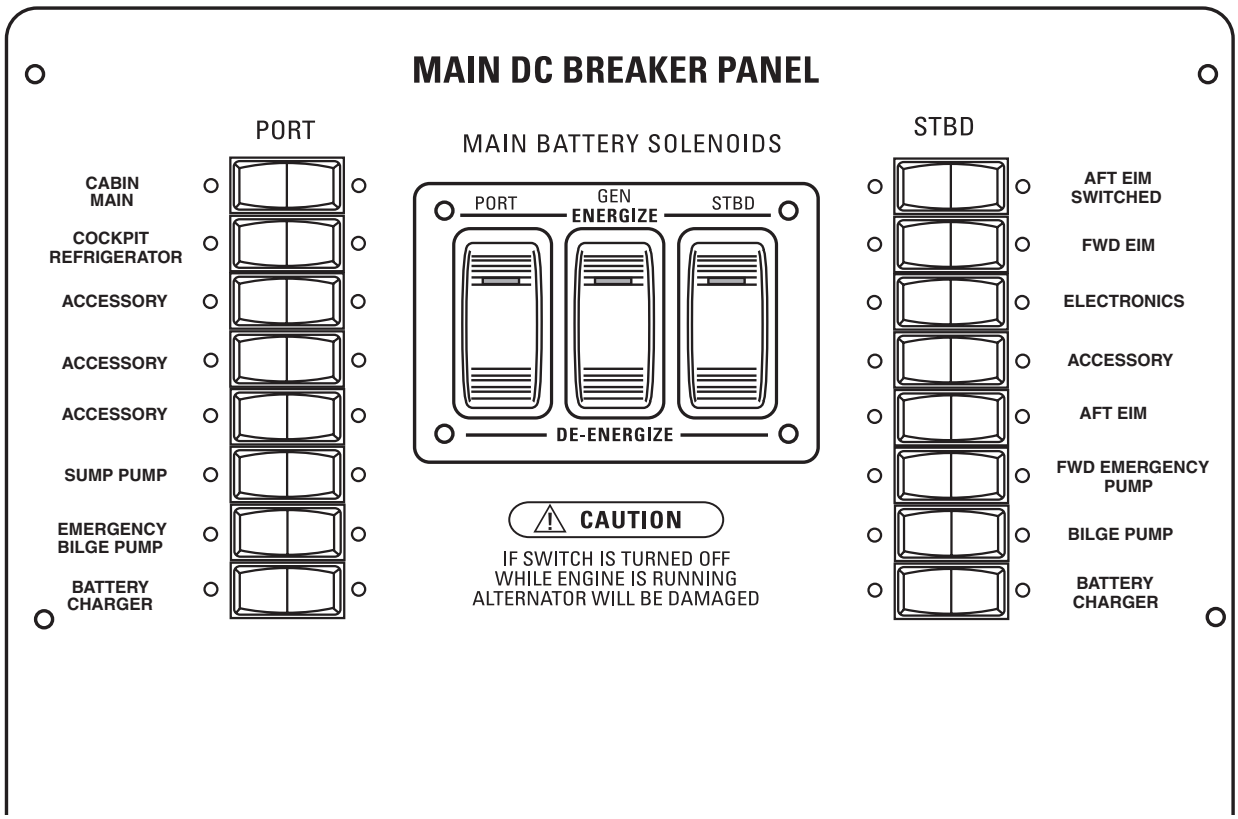
If a fuse or breaker is replaced with one of higher amperage, it will not provide adequate protection against an electrical malfunction and will create a fire hazard.

4. MAIN DC BREAKER PANEL

The main DC breaker panel (Figure 6.6.1) is located in the engine room on the forward equipment board. The panel contains breakers for various equipment plus the 12VDC battery switches.

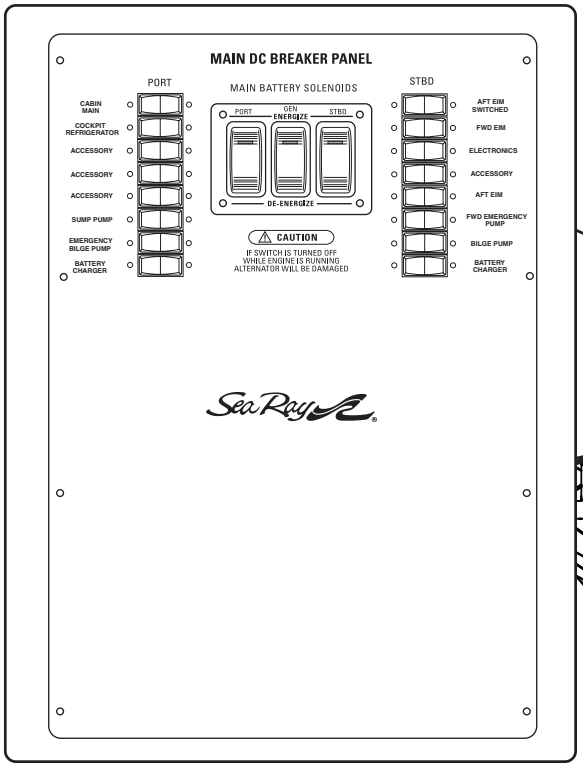
The bilge pump, emergency bilge pumps, sump pump, battery chargers and aft EIM unswitched remain energized at all times and CANNOT be turned OFF with the battery switches. The entire remaining DC system CAN be turned OFF with the battery switches.

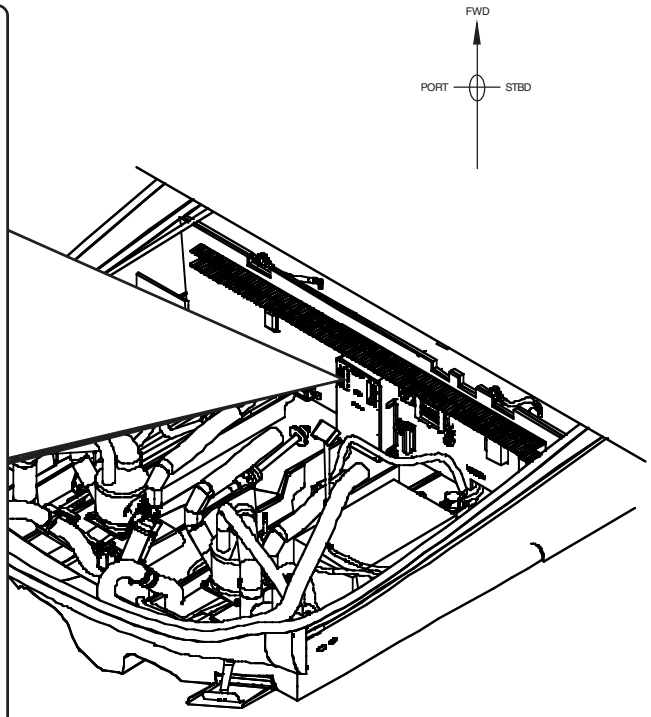
MAIN DC BREAKER PANEL (LOCATED ON THE FORWARD BULKHEAD IN THE ENGINE ROOM) (FIG. 6.6.1)



12 Volt DC Breakers	Amperage	12 Volt DC Breakers	Amperage
Cabin Main	50	Aft EIM Switched	50
Cockpit Refrigerator	15	Fwd EIM	50
Accessory		Electronics	30
Accessory		Accessory	5
Accessory		Aft EIM Unswitched	50
Sump Pump	5	Fwd Emergency Bilge Pump	10
Emergency Bilge Pump	10	Bilge Pump	10
Batt Charger Output Port	50	Batt Charger	50

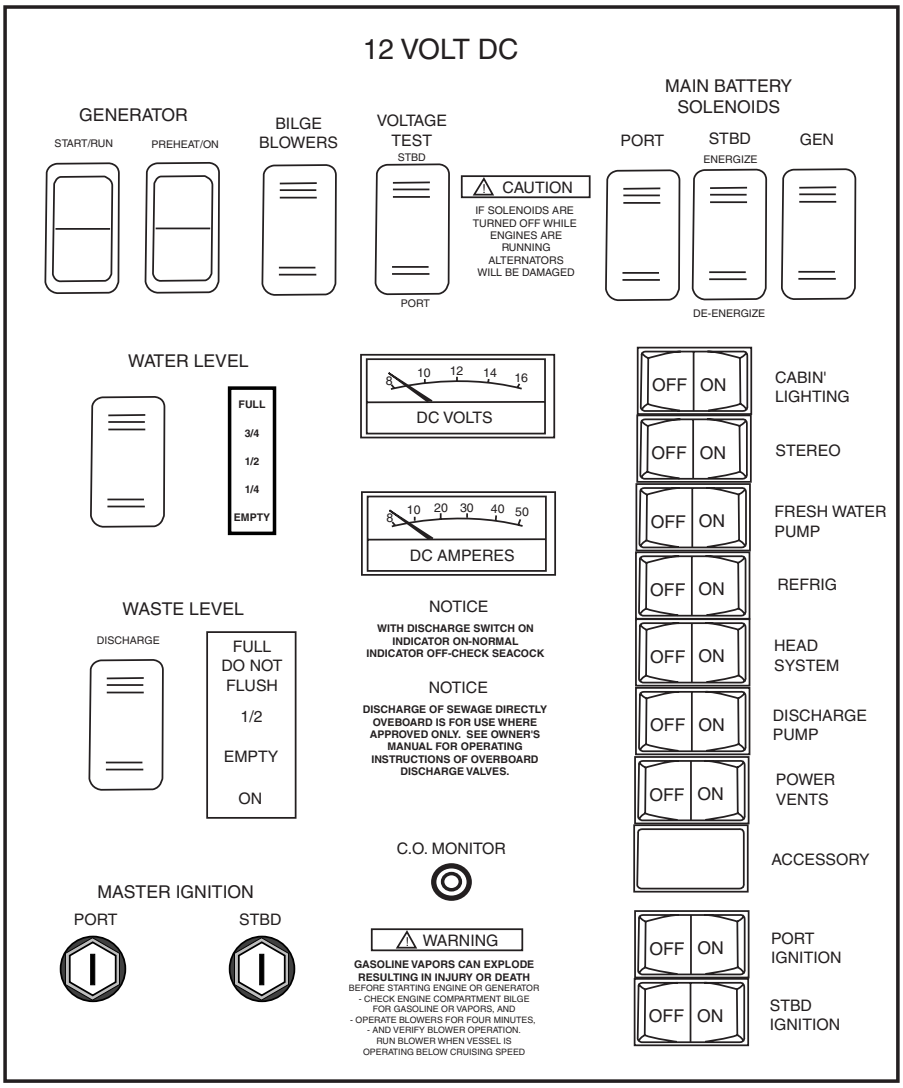
MAIN DC DISTRIBUTION PANEL LOCATIONS
(FORWARD ENGINE ROOM BULKHEAD) (FIG. 6.7.1)





5. CABIN DC DISTRIBUTION PANEL CONTROLS & FUNCTIONS

CABIN DC BREAKER PANEL (LOCATED IN THE CABINET AFT OF SALON DINETTE/SOFA) (FIG. 6.8.1)



12 Volt DC Breakers	Amperage	12 Volt DC Breakers	Amperage
Cabin Lighting	20	Accessory	Plugged
Stereo	25	Port Ignition	10
Fresh Water Pump	10	Starboard Ignition	10
Refrigerator	15	Carbon Monoxide (CO) Monitor	1
Head System	10		
Discharge Pump (Option)	10		
Power Vents	7.5		

6. ELECTRIC SWITCHING SYSTEM

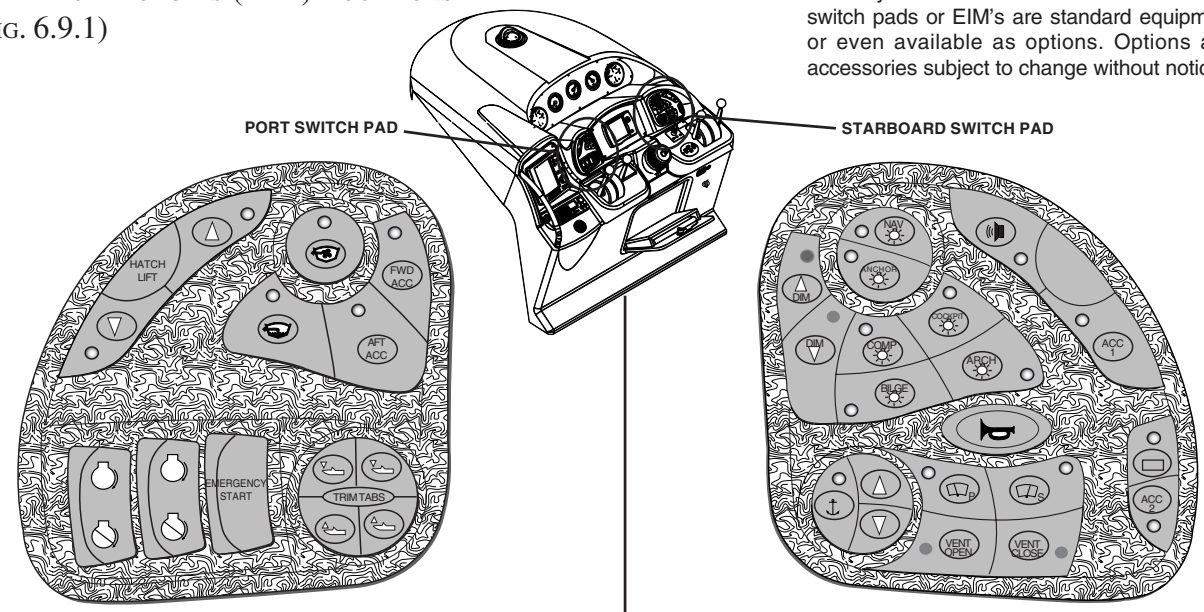
The 340 DA is equipped with illuminated waterproof electronic switch pads. The individual switch functions are indicated by ISO symbols. (See FIG. 2.9.1 and 2.9.2)

Electrical equipment illustrated on the switch pads are connected to the Electronic Interface Modules (EIM's).

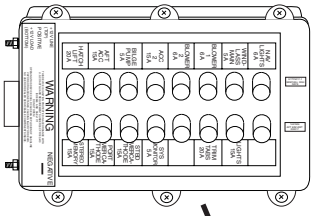
Each EIM is fitted with breakers for each piece of equipment connected to it. If a piece of electrical equipment will not function check its corresponding breaker on the EIM.

ELECTRONIC SWITCH PADS & ELECTRONIC INTERFACE MODULES (EIM) LOCATIONS (FIG. 6.9.1)

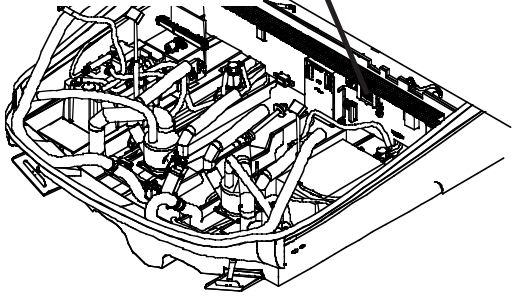
NOTE: Switch pads and EIM's are generic in nature and may be used on more than one Sea Ray® model. Not all accessories shown on switch pads or EIM's are standard equipment or even available as options. Options and accessories subject to change without notice.



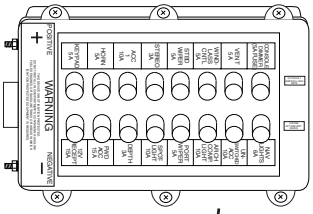
AFT ELECTRONIC INTERFACE MODULE (EIM)
(LOCATED ON THE ACCESSORY BOARD ON THE FORWARD PORT SIDE OF THE ENGINE COMPARTMENT)

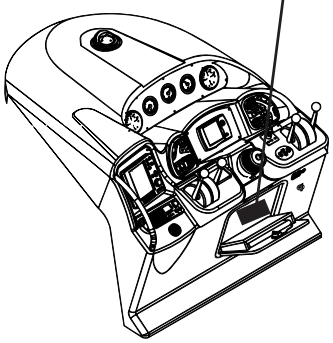


NOTE: THIS BOX IS IGNITION PROTECTED. DO NOT OPEN. READ WARNING ON BOX IN ENGINE COMPARTMENT.



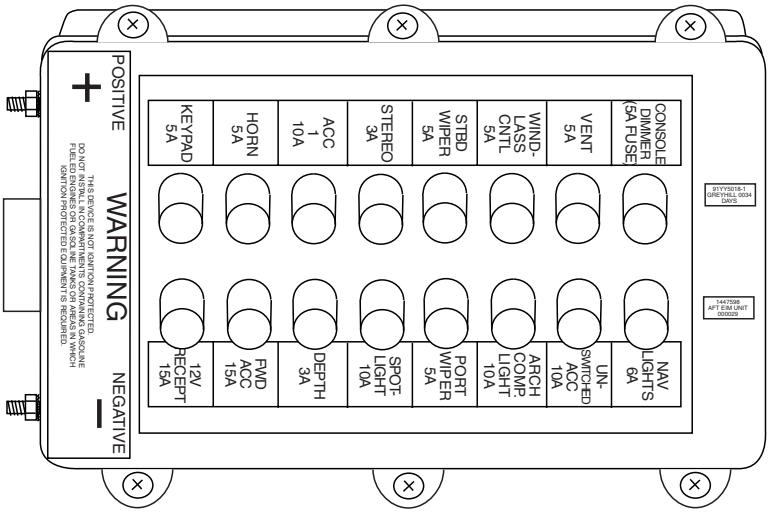
FORWARD ELECTRONIC INTERFACE MODULE (EIM)
(LOCATED AT THE HELM IN THE COMPARTMENT BELOW THE ENGINE SHIFT AND THROTTLE)





ELECTRONIC INTERFACE MODULES (EIM)
(FIG. 6.10.1)

FORWARD ELECTRONIC INTERFACE MODULE (EIM)
(LOCATED AT THE HELM IN THE COMPARTMENT BELOW THE STEERING WHEEL)

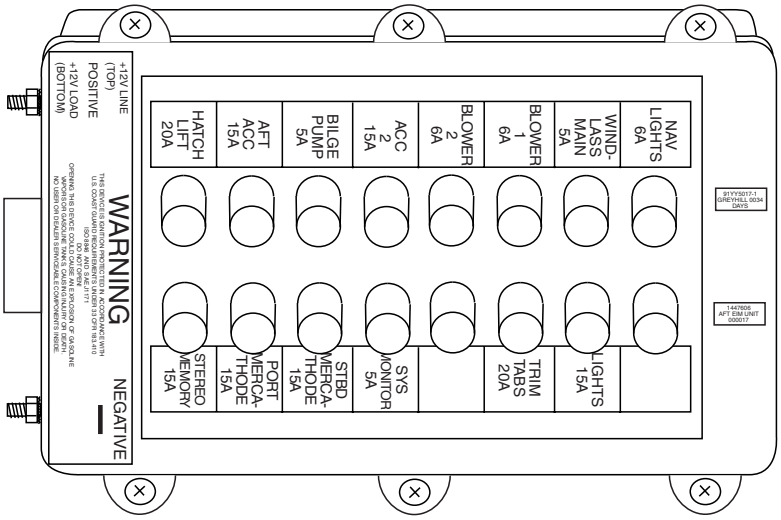


BREAKER NAME	BREAKER AMPERAGE 12VDC
CONSOLE DIMMER	5 (FUSE)
VENT	5
WINDLASS CONTROL	5
STARBOARD WIPER	5
STEREO	3
ACCESSORY 1	10
HORN	5
KEYPAD	5
NAV LIGHTS	6
UN-SWITCHED ACCESSORY	10
ARCH COMP. LIGHT	10
PORT WIPER	5
SPOTLIGHT	10
DEPTH FINDER	3
FORWARD ACCESSORY	15
12 VOLT RECEPTACLE	15
NOT SHOWN	
SPOILER LIGHTS	10
COMPARTMENT LIGHTS	10

(FIG. 6.10.2)

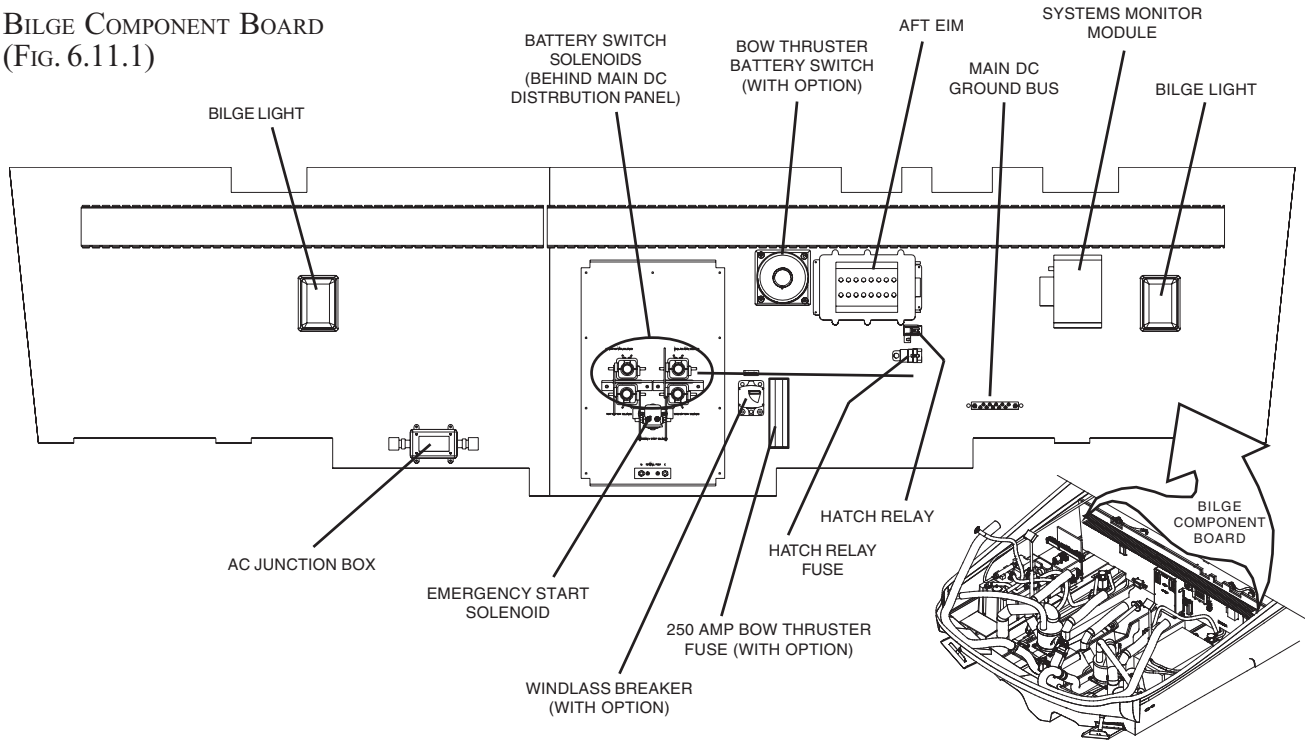
AFT ELECTRONIC INTERFACE MODULE (EIM)
(LOCATED IN THE ENGINE ROOM ON THE FORWARD EQUIPMENT BOARD)

NOTE: THIS BOX IS IGNITION PROTECTED. DO NOT OPEN! READ WARNING ON BOX IN ENGINE COMPARTMENT.



BREAKER NAME	BREAKER AMPERAGE 12VDC
NAVIGATION LIGHTS	6
WINDLASS MAIN	5
BLOWER 1	7
BLOWER 2	7
ACCESSORY 2	15
BILGE PUMP	5
AFT ACCESSORY	15
HATCH LIFT	20
LIGHTS	15
TRIM TABS	20
SYSTEM MONITOR	5
STARBOARD MERCATHODE	15
PORT MERCATHODE	15
STEREO MEMORY	15
NOT SHOWN	
SMARTCRAFT UNSWITCHED	15
COCKPIT LIGHTS BILGE LIGHTS COMPARTMENT LIGHTS	}15

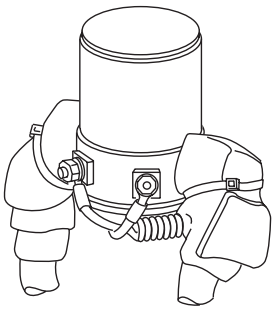
BILGE COMPONENT BOARD
(FIG. 6.11.1)



7. EMERGENCY START SYSTEM

The emergency start system utilizes a momentary switch, located on the control station switch panel and an emergency start solenoid, located in the engine room. Holding the switch energizes the solenoid which parallels the batteries to assist in starting. Use emergency start when the charge of one bank if batteries is insufficient to start its corresponding engine. To engage the emergency start system, start whichever engine has sufficient battery power, then hold emergency start switch while starting the other engine.

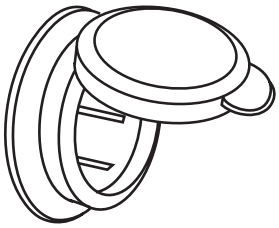
EMERGENCY START SOLENOID
(FIG. 6.11.2)



8. 12 VOLT ACCESSORY RECEPTACLE

Your boat has a 12 volt accessory receptacle on the helm panel and in the galley. The receptacle is a cigarette lighter style plug that may be used with any 12 volt accessories using this type of plug.

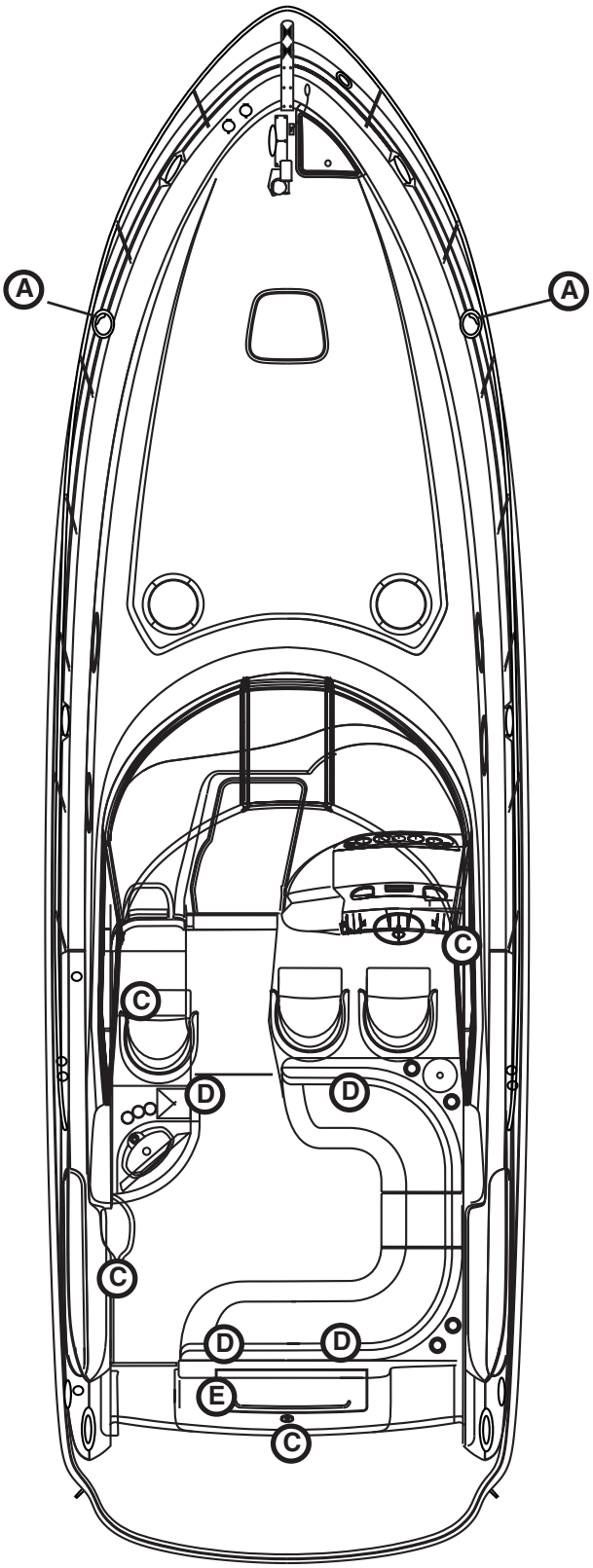
12 VOLT ACCESSORY RECEPTACLE
(FIG. 6.11.3)



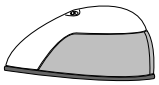
9. LIGHTING

Your boat is equipped with a variety of different lighting fixtures (Figure 6.13.1 & 6.14.1). **Always replace a bulb using the type and wattage of the original bulb.**

EXTERIOR LIGHTS
(FIG. 6.12.1)

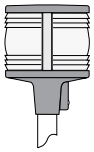


BOW NAV. LIGHT



BULB REPLACEMENT
BULB# GE2641L
12V R 10W
A

MAST NAV. LIGHT

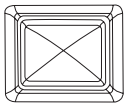


BULB REPLACEMENT
FUSE TYPE BULB
#12V10WPERKO FIG.71
B

COCKPIT LIGHT & STERN NAV. LIGHT

BULB REPLACEMENT
FUSE TYPE BULB
#12V10WPERKO #70-0
C

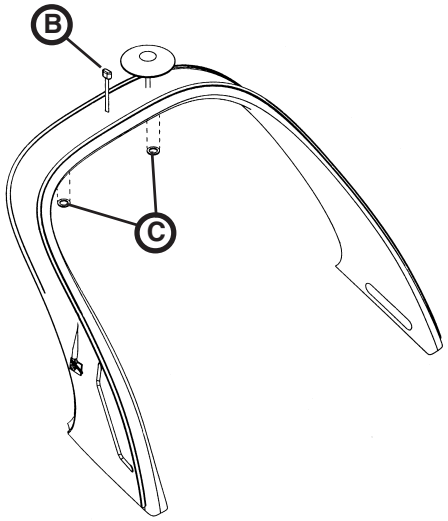
BILGE LIGHT



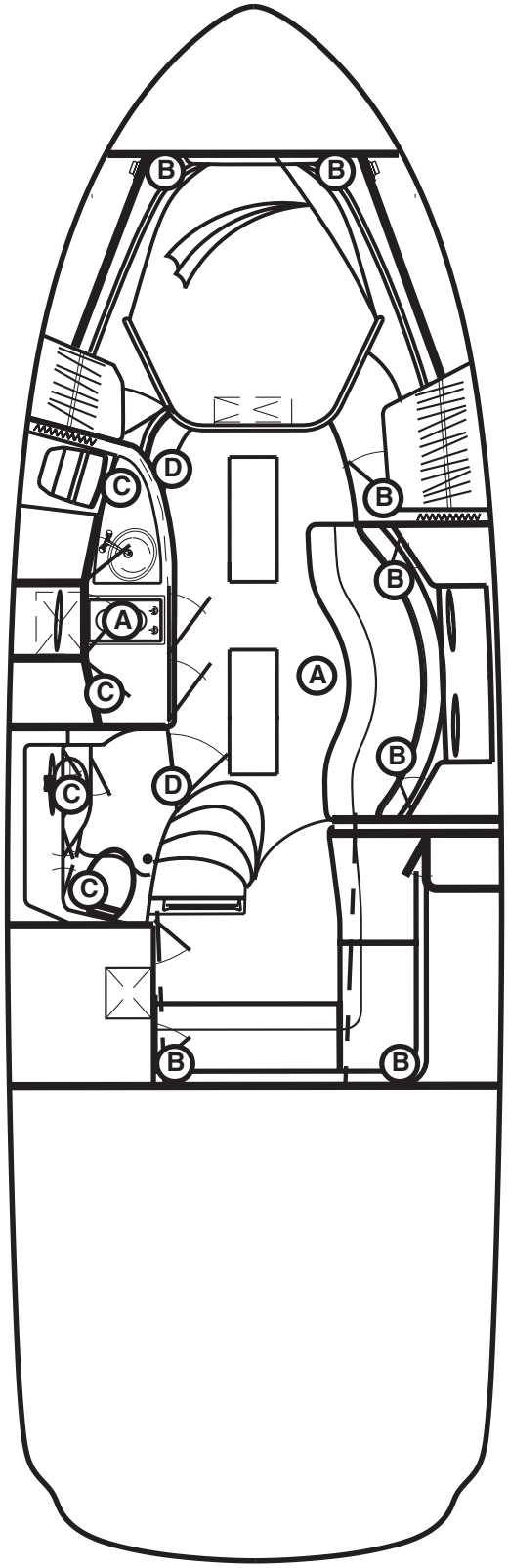
BULB
REPLACEMENT
BULB#CEC1141
D
IN THE ENGINE
COMPARTMENT

AFT STORAGE LIGHT

BULB REPLACEMENT
FUSE TYPE BULB
#12864 12V5W
E

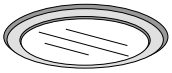


INTERIOR LIGHTS
(FIG. 6.13.1)



ROUND GALLEY & SALON DUAL VOLTAGE LIGHT

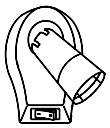
A



12 VOLT BULB REPLACEMENT HALOGEN 12V 10W BI-PRONG

12O VOLT BULB REPLACEMENT E14 110V 25W

SWIVEL LIGHT



B BULB REPLACEMENT HALOGEN 12V 10W BI-PRONG

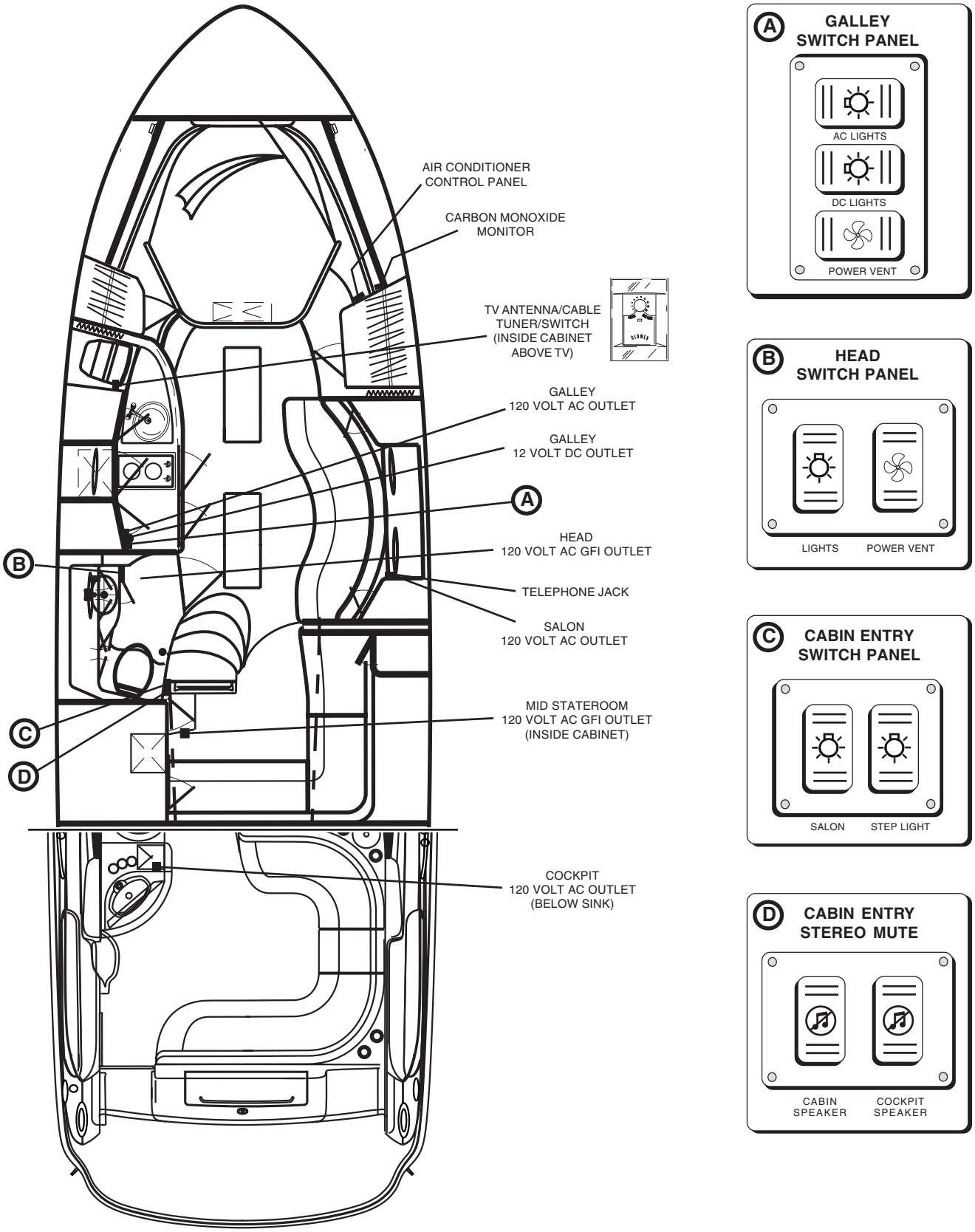
ROUND LIGHT

C BULB REPLACEMENT HALOGEN 12V 10W BI-PRONG

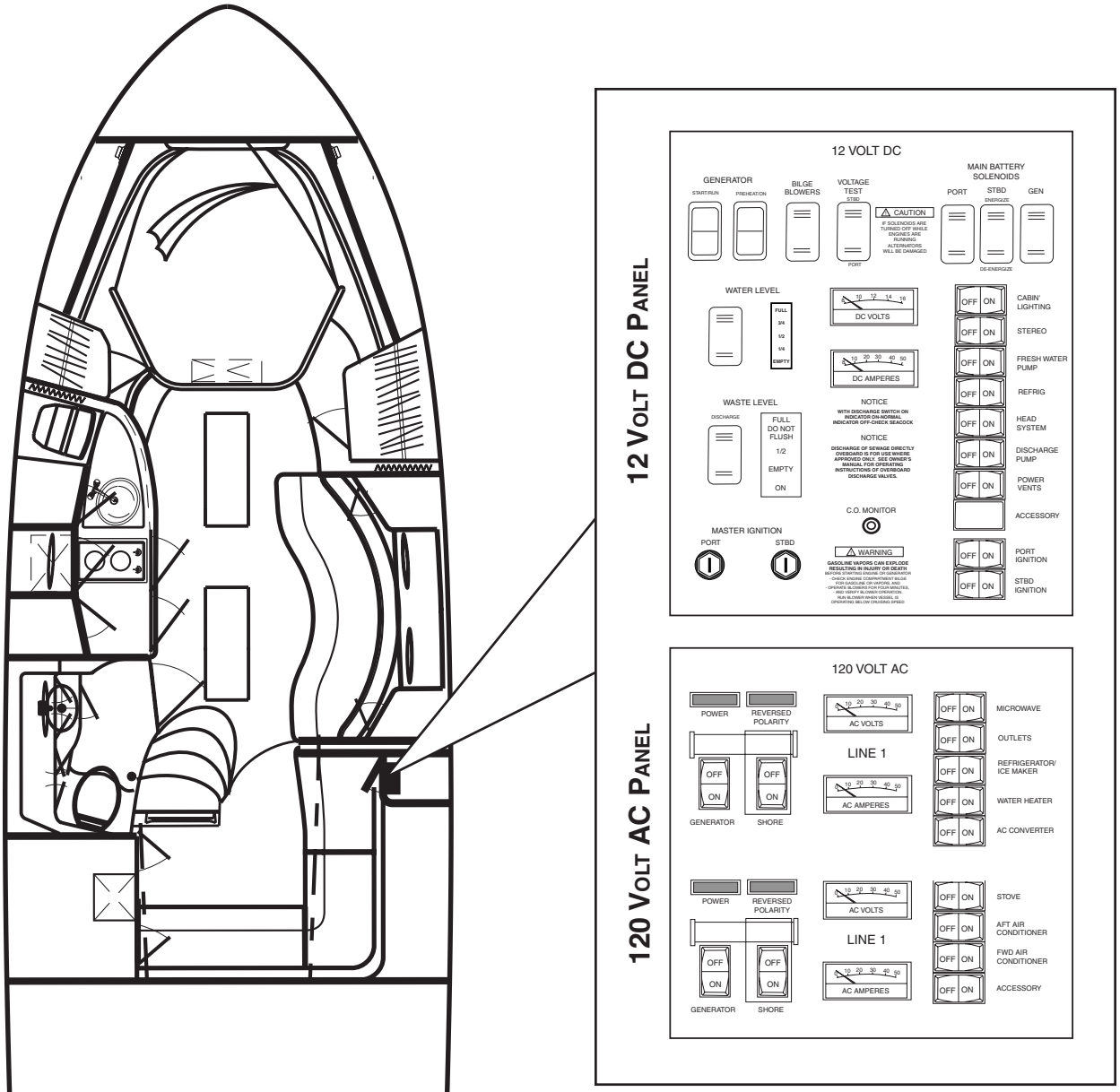
STEP LIGHT

D LED

SWITCH FUNCTION & LOCATIONS
(FIG. 6.14.1)



12 VOLT DC & 120 VOLT AC SALON POWER PANEL LOCATIONS (FIG. 6.15.1)



10. AC SYSTEM

⚠ DANGER

EXTREME HAZARD – Swimming near a boat operating on AC electrical system can lead to severe shock and death. Never swim or allow swimming when AC system is in use.

NOTE: Actual usage of equipment will depend on the amperage output of the power source available.

Line voltage from the generator or shore power is shown by the voltmeter on the main distribution panel.

When equipped with generator option the main distribution panel main breakers are equipped with a source selector slide to prevent the generator and shore power from being energized at the same time and damaging the electrical system. Both breakers must be in the OFF position before switching to an alternate power source.

⚠ WARNING

Under no circumstances override the source select system.

The main breakers may trip if there is a surge in line voltage, an electrical storm or an onboard system overload. The main breaker interrupts both the neutral and hot feeds in the AC circuit to prevent equipment damage due to internal overloads and external surges.

120 Volt / 60 Hz Wiring (Standard System)

The 120 volt wiring installed on Sea Ray® boats consists of three (3) color-coded wires. The black wire is the “hot” feed, white is the common, or neutral, and the green wire is the ground. All branch breakers and switches for AC equipment are installed on the “hot” wire. The green conductor of the shore power is connected through the galvanic isolator and then connected to the AC grounding bus bar behind the main distribution panel.

⚠ CAUTION

Never operate 120 volt shore power at less than 110 volts.

220 Volt / 50 Hz Wiring (Optional System)

The 220 volt / 50Hz wiring installed on Sea Ray® boats consists of three (3) color-coded wires. The brown wire is the “hot” feed, light blue is the common, or neutral, and the green wire is the ground. All branch breakers and switches for AC equipment are installed on the “hot” wire. The green conductor of the shore power is connected through the galvanic isolator and then connected to the AC grounding bus bar behind the main distribution panel.

⚠ CAUTION

Never operate 220 volt shore power at less than 205 volts.

11. SHORE POWER

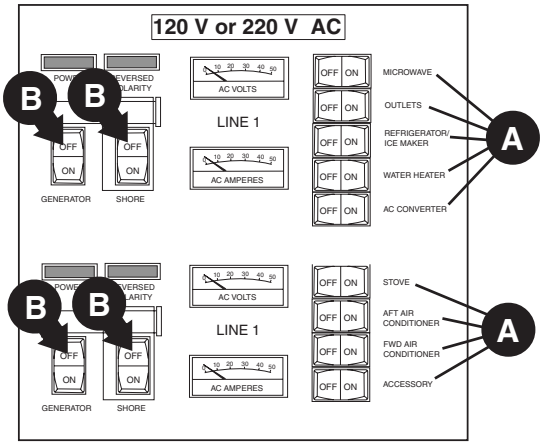
A. TO CONNECT AND TURN ON SHORE POWER

1. **<u>On The Boat: Turn OFF All Breakers</u>**

A. Turn OFF equipment breakers

B. Turn OFF SHORE & GENERATOR breakers.

MAIN DISTRIBUTION PANEL (MDP) (FIG. 6.16.1)

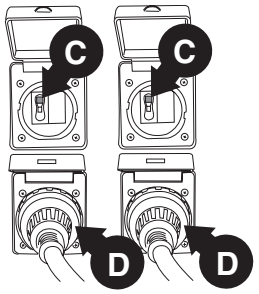


Note: The power panel on your boat may not look exactly like this one.

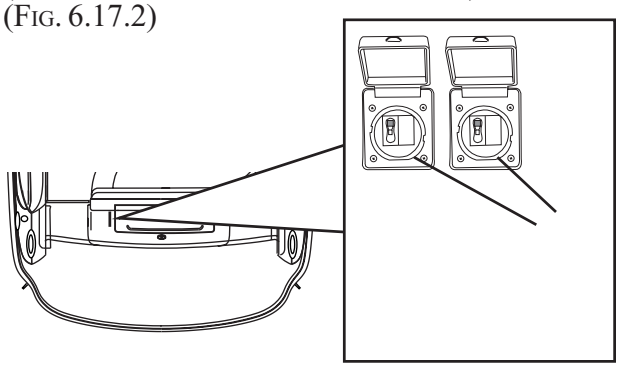
C. Turn OFF Main AC breakers above the shore power plug in the transom compartment.

D. Dry off the shore power cord receptacle on your boat. Dry off the ends of the shore power cord. Spray a moisture repellant into the receptacle and cord ends. **On the boat,** plug a cord end into the boat receptacle. Turn clockwise to lock. Thread the locking ring onto the boat receptacle to prevent accidental unplugging.

MAIN AC BREAKERS AND SHORE POWER RECEPTACLE (FIG. 6.17.1)



MAIN SHORE POWER BREAKER BOXES (IN TRANSOM STORAGE COMPARTMENT) (FIG. 6.17.2)



⚠ CAUTION

It is imperative that the shore power outlet is dry before plugging into the dock power inlet.

⚠ CAUTION

Route and tie the power cord from the boat to the dockside power outlet box to prevent persons tripping over it and the cord falling in the water.

⚠ CAUTION

Shore power cord should be secured or routed to avoid laying or falling into water and to avoid stress on shore power plug and inlet.

⚠ CAUTION

The use of extension shore power cords is not recommended. Excessive power cord extensions can cause a voltage drop and may prevent some electronic devices from operating correctly.

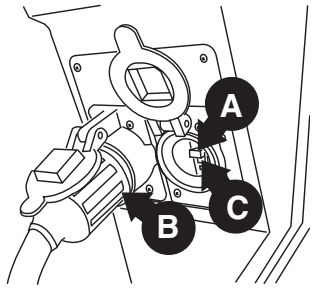
2. **On The Dock:**

A. Turn OFF Dock Breaker.

B. Wipe the outlet dry, spray moisture repellant into the receptacle, then plug the other end of the power cord into the outlet box on the dock.

C. Turn ON Dock Breaker.

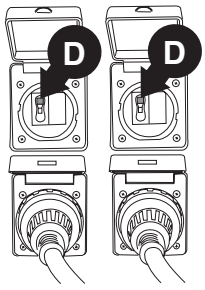
DOCK POWER BOX (FIG. 6.17.3)



On The Boat:

D. Turn ON the main AC breakers above the shore power plug in the transom compartment.

MAIN AC BREAKERS AND SHORE POWER RECEPTACLE (FIG. 6.17.4)



3. **On the Boat: 120 Volt or 220 Volt Main Distribution Panel (MDP)**

A. POWER Light ON. REVERSE POLARITY Light OFF.
(If reversed polarity light is on do not turn on breakers, turn OFF MAIN and DOCK breakers. Disconnect power cords. Consult dockmaster.)

⚠ CAUTION

Do not energize main breaker under reversed polarity conditions.

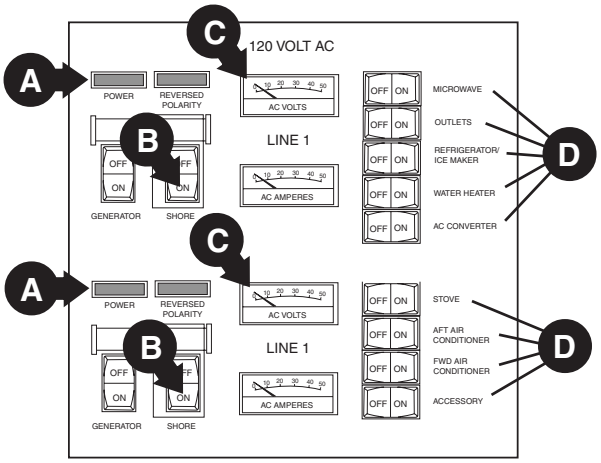
Turn ON Breakers:

B. Turn ON SHORE breaker.

C. Verify proper voltage.
(120 Volt System: 110V to 125V)
(220 Volt System: 205V to 230V) (International)

D. Turn ON Desired Equipment Breakers.

MAIN DISTRIBUTION PANEL (MDP) (FIG. 6.18.1)



Note: The power panel on your boat may not look exactly like this one.

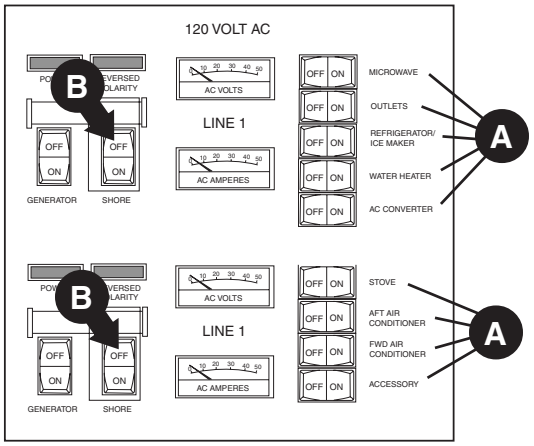
B. TO DISCONNECT SHORE POWER

1. **On the Boat: Turn OFF All Breakers**

A. Turn OFF equipment breakers.

B. Turn OFF SHORE breaker.

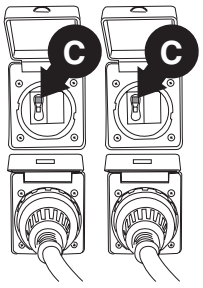
MAIN DISTRIBUTION PANEL (MDP) (FIG. 6.18.2)



Note: The power panel on your boat may not look exactly like this one.

C. Turn OFF MAIN breaker above the shore power plug in the transom compartment.

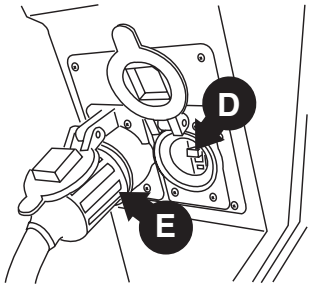
MAIN AC BREAKERS AND SHORE POWER RECEPTACLE (FIG. 6.18.3)



D. On the dock, turn OFF the dockside breaker.

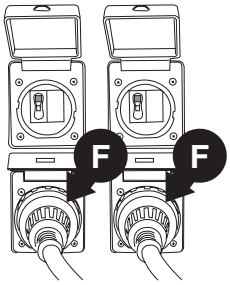
E. Disconnect the dockside end of the power cord.

DOCK POWER BOX (FIG. 6.19.1)



F. On your boat, disconnect the power cord from your boat receptacle.

MAIN AC BREAKERS AND SHORE POWER RECEPTACLE (FIG. 6.19.2)



G. Clean the power cord, spray the cord ends with moisture repellant, and store the cord in a dry location on board.

You must keep the shore power cord and the plug ends clean and dry. This is especially necessary if your boat is used in salt water. Always clean and spray your cord ends with moisture repellant before using and before storing the cord.

C. MAINTENANCE FOR SHORE POWER CABLE SET & SHORE POWER INLETS

⚠ WARNING

Disconnect the power cable from power source before performing maintenance.

The metallic parts of your cable set and inlet are made to resist corrosion. In salt water environment, life of the product can be increased by periodically wiping the exposed parts with fresh water, drying and spraying with a moisture repellent.

A soiled cable can be cleaned with grease-cutting household detergent. A periodic application of vinyl protector will help both ends and cable maintain their original appearance.

In case of salt water spray or immersion: Rinse plug end and/or connector end thoroughly in fresh water, shake or blow out excess water and allow to dry. Spray with a moisture repellent before reuse.

12. SERVICING THE MAIN DISTRIBUTION PANEL

NOTE: Servicing should be referred to a qualified electrician.

⚠ WARNING

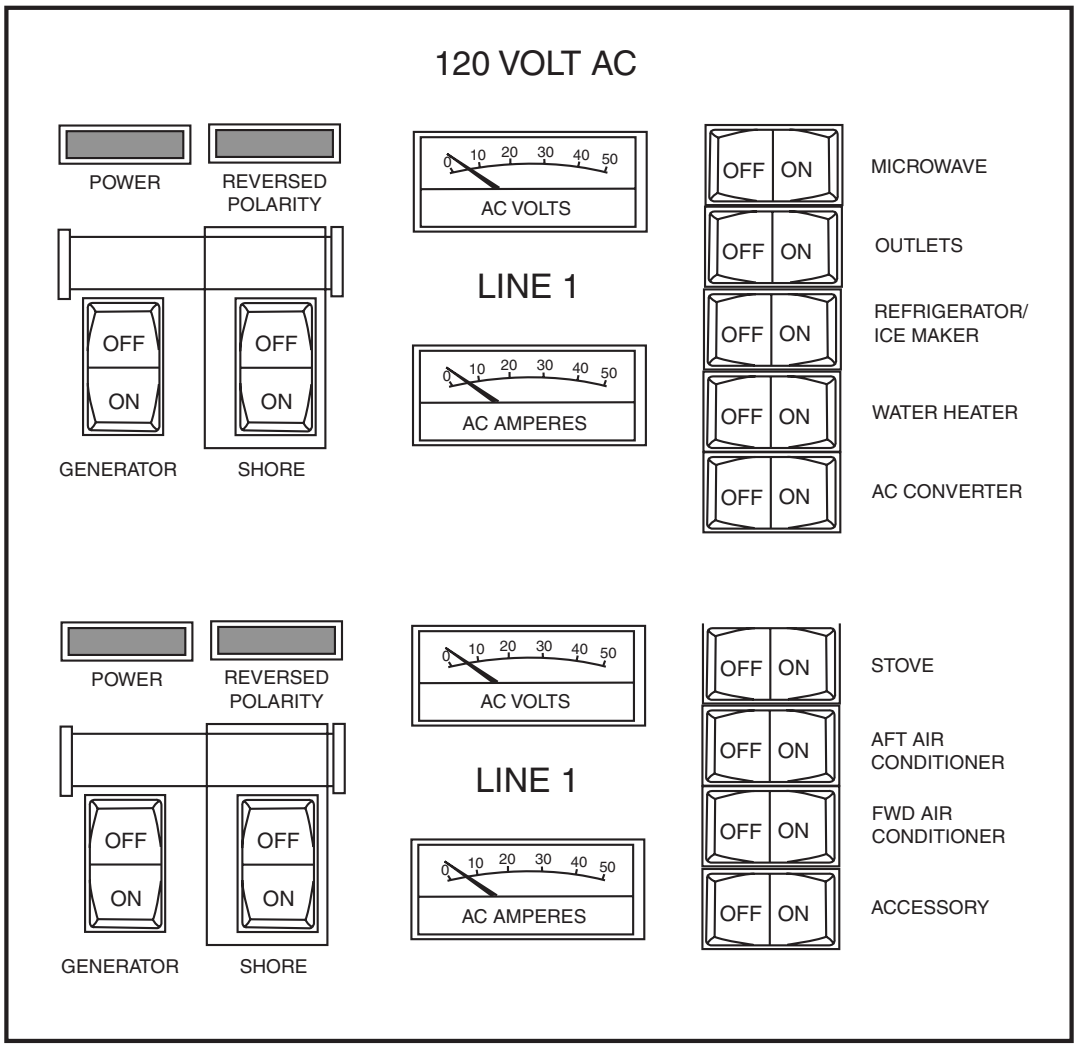
Disconnect the power cable from power source before performing maintenance.

A. TO REPLACE A FAULTY COMPONENT ON THE MAIN DISTRIBUTION PANEL:

1. Turn all breakers OFF.
2. Make sure the generator is OFF.
3. Unplug the shore power.
4. Remove screws from all sides except the hinged side of panel. The main distribution panel is hinged to swing open for servicing.
5. Reverse the procedure for closing the panel.

13. CABIN 120 VOLT MAIN DISTRIBUTION PANEL CONTROLS & FUNCTIONS

MAIN DISTRIBUTION PANEL (LOCATED IN THE CABINET AFT OF DINETTE/SOFA)
(FIG. 6.20.1)



120 Volt AC Breakers	Amperage
Shore	30
Generator Line 1	50
Generator Line 2	30
Microwave	15
Outlets	15
Refrigerator/Ice Maker	15
Water Heater	15
AC Converter	10
Stove	20
Aft Air Conditioner	Plugged
Fwd Air Conditioner	20
Accessory	Plugged

220 Volt AC Breaker (International)	Amperage
Shore	20
Generator Line 1	30
Generator Line 2	20
Microwave	10
Outlets	10
Refrigerator/Ice Maker	10
Water Heater	10
AC Converter	10
Stove	15
Aft Air Conditioner	Plugged
Fwd Air Conditioner	15
Accessory	Plugged

14. BATTERY CHARGER / CONVERTER

The battery charging unit located on the forward engine room bulkhead is fully automatic and is designed specifically for the marine environment. The high frequency characteristic has allowed these chargers to achieve a huge size and weight reduction over their previously used equipment. Commonly called high frequency or smart chargers, these units bring a new sophistication to the battery charger field. These units feature a built-in amperage indicator located on the front panel. This gives an accurate reading of the combined battery current and load current. If the batteries are fully charged and no load is present, the ammeter will read near zero. To verify that the charger is functioning properly, turn on lights or other load. The ammeter should register and increase.

⚠ WARNING

Never block air circulation through the unit. Never store any gear on top of the units.

NOTICE

Leave the converter running at all times to maintain the 12 volt system voltage.

Charging characteristics contain three (4) modes:

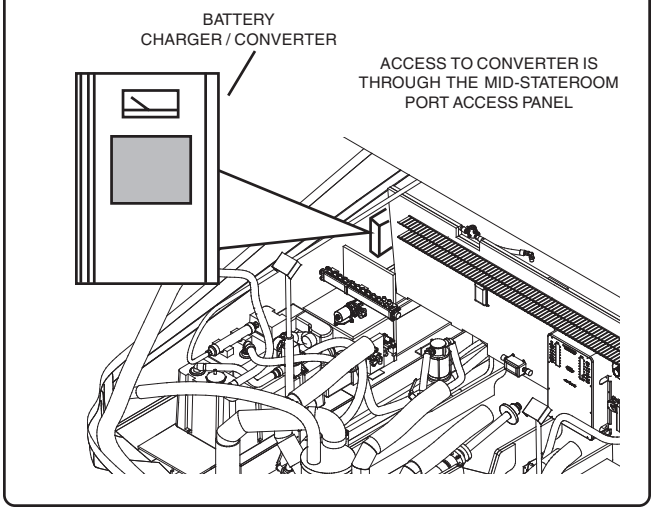
- **Boost Mode** - this is initiated at power up and provides the chargers full-rated current to the battery bank at a level of 14.4V until battery reaches 90% of full charge.
- **Normal Mode** - this stage immediately follows the bulk charge mode. It maintains the battery voltage at the bulk charge voltage level, but gradually decreases the current as the battery accepts the charge until it reaches a predetermined current level.
- **Float Mode** - this stage is designed to hold the battery at a safe, low voltage (typically 13.2V) providing up to the chargers full rated amperage to accommodate DC load requirements. The charge will remain in this mode until the 12 volt system is activated.
- **Equalize Mode** - this stage activates for 15 minutes every 21 hours. When the converter/ charger is in the float mode the voltage is increased to 14.4 volts which mixes the battery electrolyte to prevent battery stratification.

Note: Leave the charger/converter turned ON at all times to maintain battery voltage level.

Note: Check monthly to ensure that water level in the batteries is properly maintained.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

BATTERY CHARGER / CONVERTER
(FIG. 6.21.1)



15. GROUND FAULT INTERRUPTER RECEPTACLE (GFI)

Ground fault interrupter receptacle is located in the head inside the medicine cabinet above the sink. Please read and understand the CAUTION block for GFI receptacles.

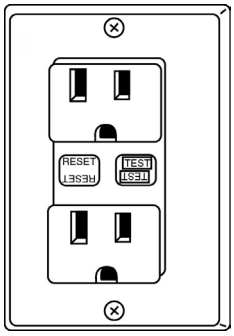
⚠ CAUTION

Persons with heart problems or other conditions which make them susceptible to electric shock may still be injured by ground faults on circuits protected by the GFI receptacle. No safety devices yet designed will protect against all hazards or carelessly handled or misused electrical equipment or wiring.

The GFI receptacle is designed to protect people from the line-to-ground shock hazards which could occur from defective power tools or appliances operating from this device, or from down-line outlets protected by it. It does not prevent line-to-ground electric shock, but does limit the time of exposure to a period considered safe for normally healthy persons. It does not protect persons against line-to-line or line-to-neutral faults.

The GFI receptacle does not protect against short circuits or overloads. This is the function of the circuit breaker.

GFI OUTLET
(FIG. 6.22.1)

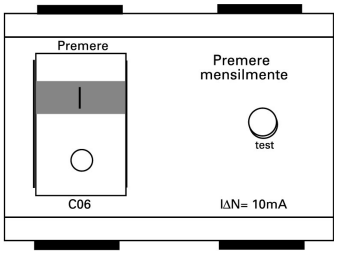


A. INTERNATIONAL RECEPTACLE

All readily accessible 220V outlets are protected by a Residual Current Circuit Breaker (RCCB). This current breaker includes a test switch to verify proper operation. Its function is similar, but not identical to the 120V GFI.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

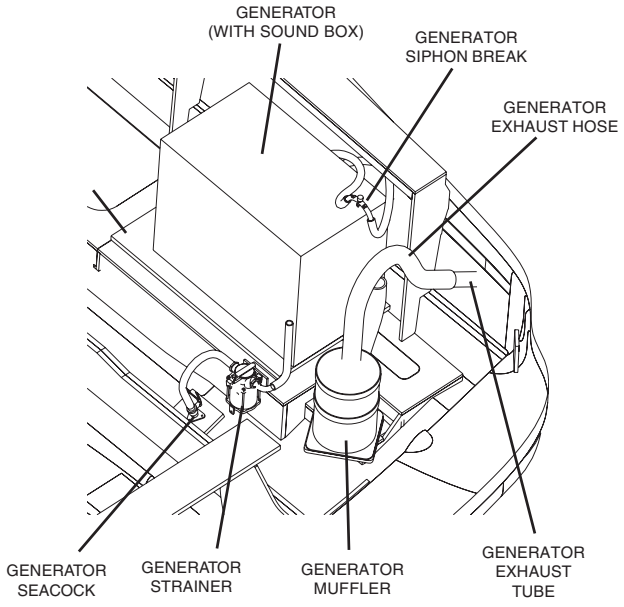
RCCB OUTLET
(FIG. 6.22.2)



16. GENERATOR

Sea Ray® strongly urges you to fully comply with the manual provided by the generator manufacturer. **The generator is warranted separately by the generator manufacturer, NOT Sea Ray®**. Follow the recommended maintenance and warranty schedule in your Generator Operator's Manual included in the Owner's Manual Packet. Generator abuse or improper maintenance may adversely affect claims made under generator manufacturer separate warranty.

GENERATOR
(WITH STANDARD INBOARD/OUTBOARD ENGINES)
(FIG. 6.22.3)



A. STARTING THE GENERATOR

NOTICE

Pre-start generator prior to getting underway as there is a possibility that it will not pick up water if started underway. Make sure the MAIN GENERATOR breaker is OFF and there is no load on the generator before starting it.

⚠ WARNING

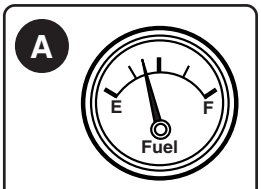
DO NOT run the engine or generator in an enclosed area, such as a closed boat house, as there is the possibility of buildup and inhaling of carbon monoxide.

(Remote control switches are located on the main distribution panel or local switches on the generator.)

To start the generator and turn on generator power:

1. **<u>On the Boat:</u>**

A. Check fuel tank levels.

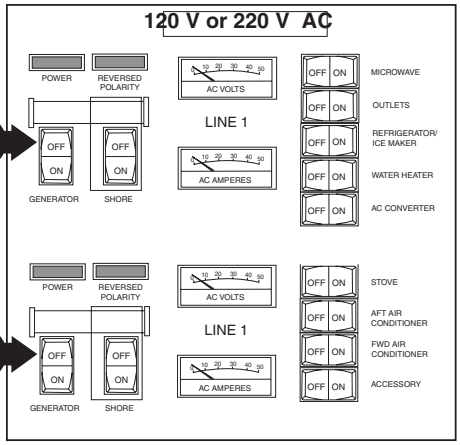


(FIG. 6.23.1)

<u>On the Boat:120 Volt or 220 Volt AC MDP:</u>

B. Ensure GENERATOR main breaker is OFF.

MAIN DISTRIBUTION PANEL (MDP) (FIG. 6.23.2)

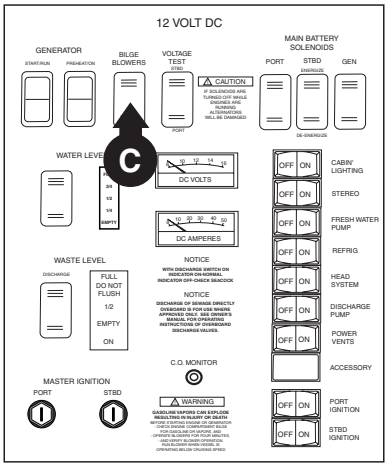


Note: The power panels on your boat may not look exactly like these.

<u>On the Boat:Cabin 12 Volt DC Panel:</u>

C. Turn ON bilge blowers. Run blowers for 4 minutes prior to starting. Leave blowers on when generator is on.

CABIN DC DISTRIBUTION PANEL (FIG. 6.23.3)



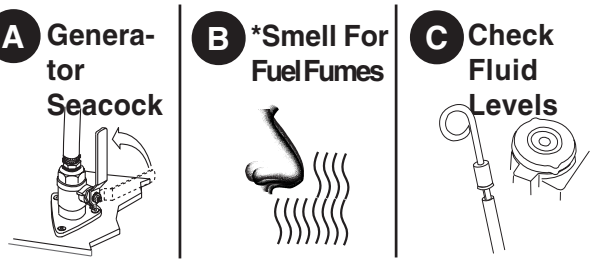
Note: The power panels on your boat may not look exactly like these.

2. **<u>In the Engine Room:</u>**

A. Open generator seacock.

B. *Smell for fuel fumes.

C. Check generator oil and coolant levels. See generator operator's manual for proper readings.



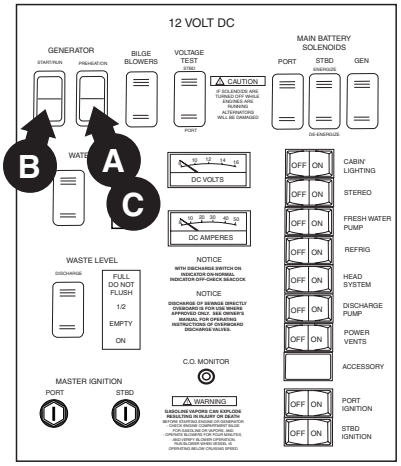
(FIG. 6.23.4)

***DANGER, Gasoline Vapors Can Explode.** Always check engine room by visual inspection and smell. Do not start the generator or engines until the source of fumes is determined and corrected and the engine room is safely ventilated.

3. **Cabin 12 Volt DC Distribution Panel:**

A. Press and hold "PREHEAT/ON".
B. Press and hold "START/RUN" switch. Release "START/RUN" switch when generator starts.
C. Continue to hold "PREHEAT/ON" for 2 or 3 seconds, then release. This bypasses the Low Oil Pressure shutdown sensor until the engine's oil pressure rises to its normal running pressure.
D. (Not shown) Check generator exhaust port to verify that water is flowing. If not, shut generator down and refer to your Generator Operator's Manual.

CABIN DC DISTRIBUTION PANEL (FIG. 6.24.1)



Note: The power panels on your boat may not look exactly like these.

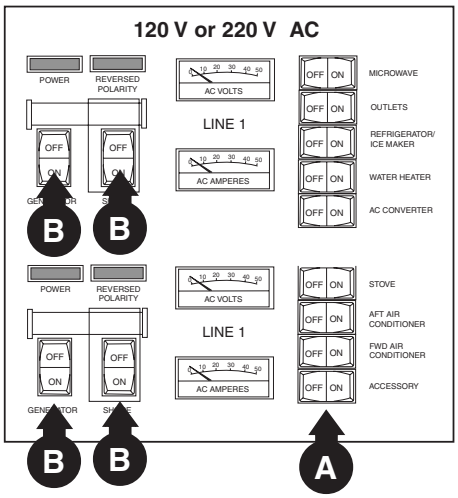
READ THE GENERATOR OWNER'S MANUAL IN THE OWNER'S MANUAL PACKET FOR YOUR GENERATOR MODEL.

B. SHIFTING FROM SHORE POWER TO GENERATOR POWER.

1. **On the Boat:120 Volt or 220 Volt AC MDP**

A. Turn OFF AC equipment breakers.
B. Turn OFF SHORE & GENERATOR breakers.

MAIN DISTRIBUTION PANEL (MDP) (FIG. 6.24.2)



Note: The power panel on your boat may not look exactly like this one.

2. **On the Dock:**

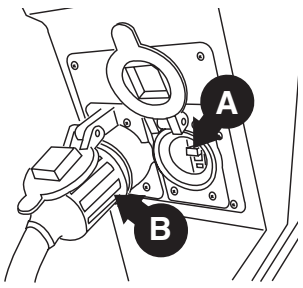
A. Turn OFF dock breaker.
B. UnPlug shore power cord.

On the Boat:

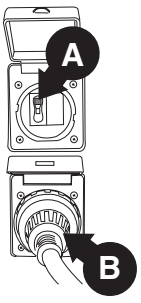
A. Turn OFF MAIN breaker above the shore power plug in the transom compartment.
B. UnPlug shore power cord.

(FIG. 6.24.3)

Power Box on the Dock



Power Connection on the Boat



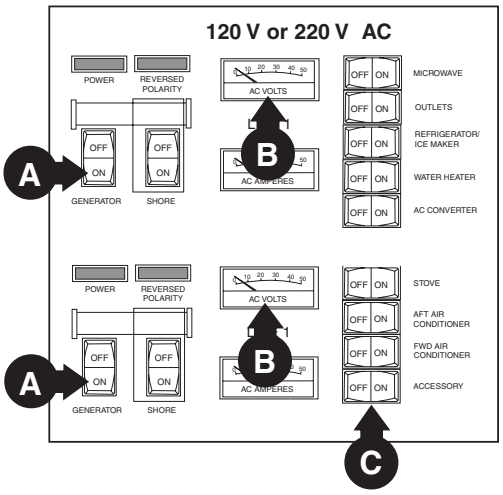
3. **On the Boat: 120 Volt or 220 Volt AC MDP**

A. Turn ON "GENERATOR" breaker.

B. Verify proper voltage.
(120V System: 105V to 125V)
(220V System: 205V to 225V)

C. Turn ON AC equipment breakers.
(Only turn on equipment you want to use. Always turn on "AC CONVERTER" breaker.)

MAIN DISTRIBUTION PANEL (MDP) (FIG. 6.25.1)



Note: The power panel on your boat may not look exactly like this one.

C. STOPPING THE GENERATOR

1. **On the Boat:120 Volt or 220 Volt AC MDP**

A. Turn OFF AC equipment breakers.

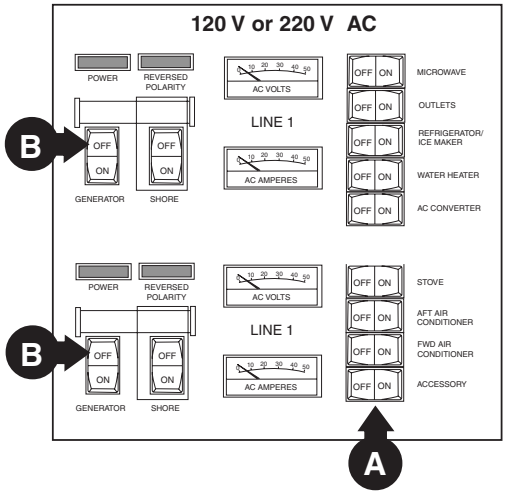
B. Turn OFF GENERATOR breakers. Allow the generator to run a few minutes to cool down. If desired, transfer to shore power.

Cabin 12 Volt DC Distribution Panel:

C. Press the bottom half of the generator "START/RUN" switch. The generator will stop. Leave switch in the STOP position to prevent overheating of the electric fuel valve.

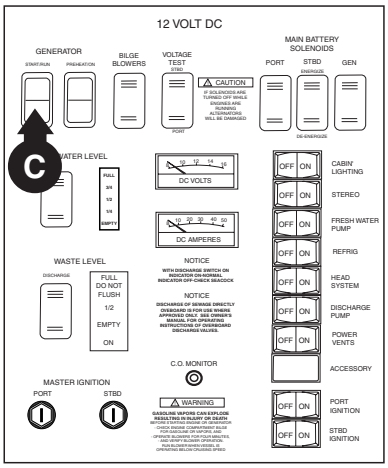
REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

MAIN DISTRIBUTION PANEL (MDP) (FIG. 6.25.2)



Note: The power panel on your boat may not look exactly like this one.

CABIN DC DISTRIBUTION PANEL (FIG. 6.25.3)



Note: The power panels on your boat may not look exactly like these.

17. ELECTROLYTIC CORROSION AND ZINC ANODES

Electrolytic corrosion of metals on power boats can result in rapid and serious deterioration of metal parts. You must set a regular schedule and look for the possibility of electrolytic corrosion (the deterioration of metals due to dissimilar characteristics when placed in salt water). It is your responsibility to check for and replace parts damaged due to electrolytic corrosion.

To minimize electrolytic corrosion of the metals on your boat, zinc anode plates are provided on your boat to protect underwater hardware. Zinc, being much less "noble" than the copper-based alloys and aluminum used in underwater fittings, will deteriorate first and protect the other metals.

Stern drives are fitted with zinc anodes on their lower units (refer to your Engine Owner's Manual for their locations). If your boat is equipped with trim tabs, zinc plates are installed on each of the trim tabs. If boat is equipped with Mercathode® stern drive may not have zincs.

Zinc anodes require replacement about every six months, if the boat is operated in salt water. In fresh water, the zinc anodes can be replaced about once a year.

If the anodes deteriorate more rapidly than this, there is probably a stray current problem within the boat or at the slip or mooring.

If the anodes do not deteriorate, they are not protecting the other metallic parts of your boat. This can be caused by loose anodes or by low grade zinc or by not having a solid electrical contact between the anode and the metal it contacts, or by paint on the anodes.

If the anodes are deteriorating rapidly, or not at all, contact your dealer.

When an AC shore power system is connected to the boat, the underwater metal fittings will, in effect, be connected through the water to grounded metals ashore. This results in the zincs being consumed at a faster rate unless the marina maintains a protective system to prevent this. When the marina provides a zinc anode in the water bonded to the metal outlet box on the dock, zinc loss on the boat will be reduced. Do not connect this zinc to the boat's ground system.

It is extremely important that all electrically-operated DC equipment and accessories be wired so that the ground polarity of each device is the same as that of the battery. Your boat has a negative ground system. The zinc anode is connected to every metal item in the boat (fuel tanks, underwater gear, etc.) via the green bonding wire.

⚠ CAUTION

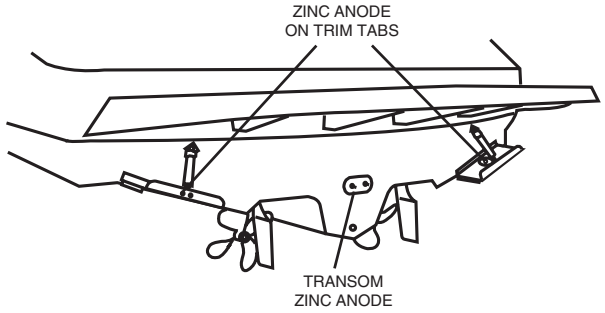
Never disconnect the green wire (safety ground) from the engine terminal.

NOTICE

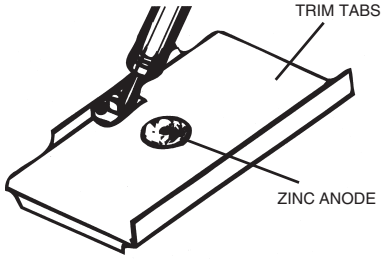
DO NOT PAINT BETWEEN THE ZINC AND THE METAL IT CONTACTS, AND DO NOT PAINT OVER THE ZINC.

Galvanic Isolator: Electrolytic corrosion can also be caused by "stray currents" due to a fault in an electrical item, even though correctly grounded. A galvanic current isolator (zinc saver) is standard on all Sea Ray® boats. It is installed between the shore power ground and the boats' AC grounding connection to the DC bonding system. This connection maintains the safety ground from

STANDARD INBOARD ENGINES
ZINC ANODES ON TRANSOM & TRIM TABS (FIG. 6.26.1)



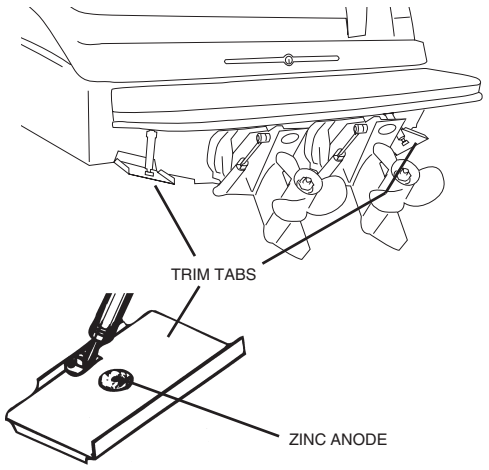
ZINC ANODES ON TRIM TABS
(FIG. 6.26.2)



dockside power while stopping the flow of DC corrosive currents.

The galvanic isolator is located behind the cabin AC & DC power panels.

OPTIONAL I/O STERN DRIVE ENGINE ZINC ANODES ON TRANSOM & TRIM TABS (FIG. 6.27.1)



18. MARINE ELECTRONIC CATHODIC ANTI-CORROSION SYSTEM (MERCATHODE®) (WITH OPTIONAL INBOARD/OUTBOARD ENGINES ONLY)

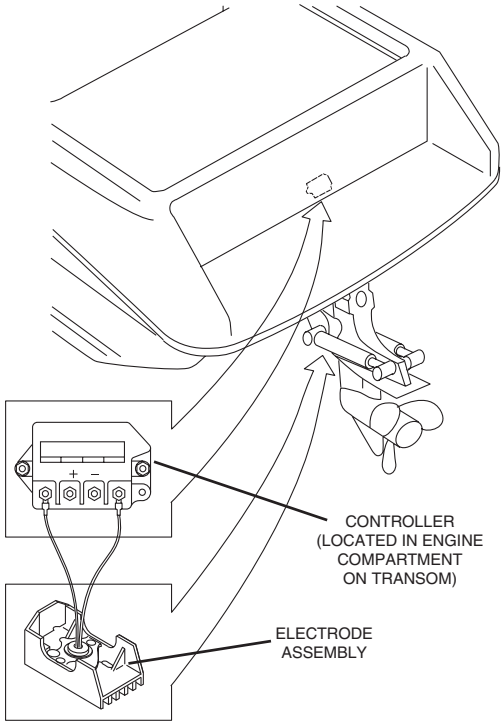
The automatically controlled Cathodic Anti-Corrosion System for marine installation protects underwater metals from the effects of corrosion and electrolysis on stern drives. The system components are designed for marine service. DO NOT PAINT THE MERCATHODE® SYSTEM.

The anode and reference electrode are attached to the electrode assembly under each stern drive unit. The solid state controller is mounted within a plastic housing on the transom in the bilge.

Maintenance

The Mercathode® system must be tested to ensure adequate output. The test should be performed every 100 hours or annually. Contact your authorized Sea Ray® dealer to arrange for this test. Refer to the engine operator's manual for more detailed information.

MERCATHODE® SYSTEM (FIG. 6.27.2)



19. AC & DC ELECTRICAL SCHEMATICS & WIRING HARNESSES

This owner's manual contains electrical schematics and wiring harness illustrations for your boat. (Refer to subsections 20 & 21) These electrical schematics were generated by electrical CAD designers at the engineering division for technical reference and service technicians. Sea Ray® does not recommend that you attempt to work on the boat's electrical system yourself. Instead, we recommend that you take your boat to your authorized Sea Ray® dealer for service. Sea Ray® reserves the right to change or update the electrical system on any model at any time without notice to the consumer and is NOT obligated to make any updates to units built prior to changes.

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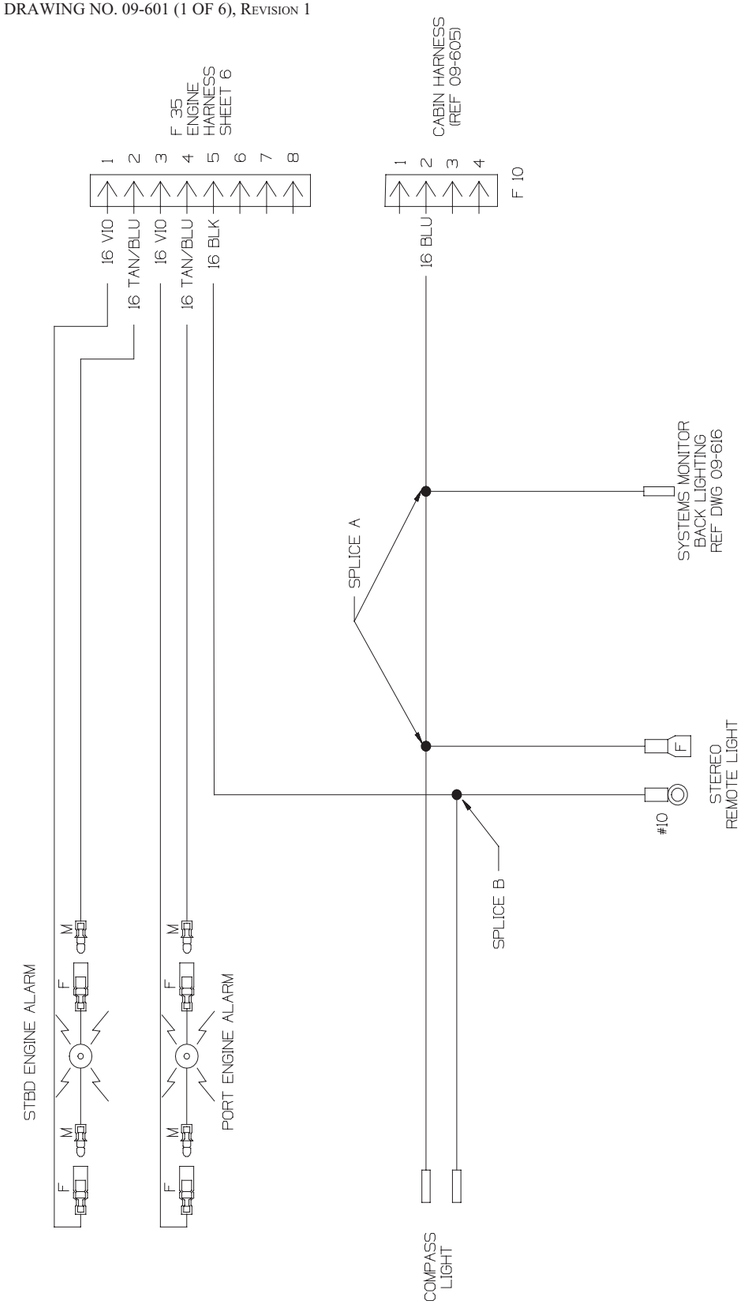
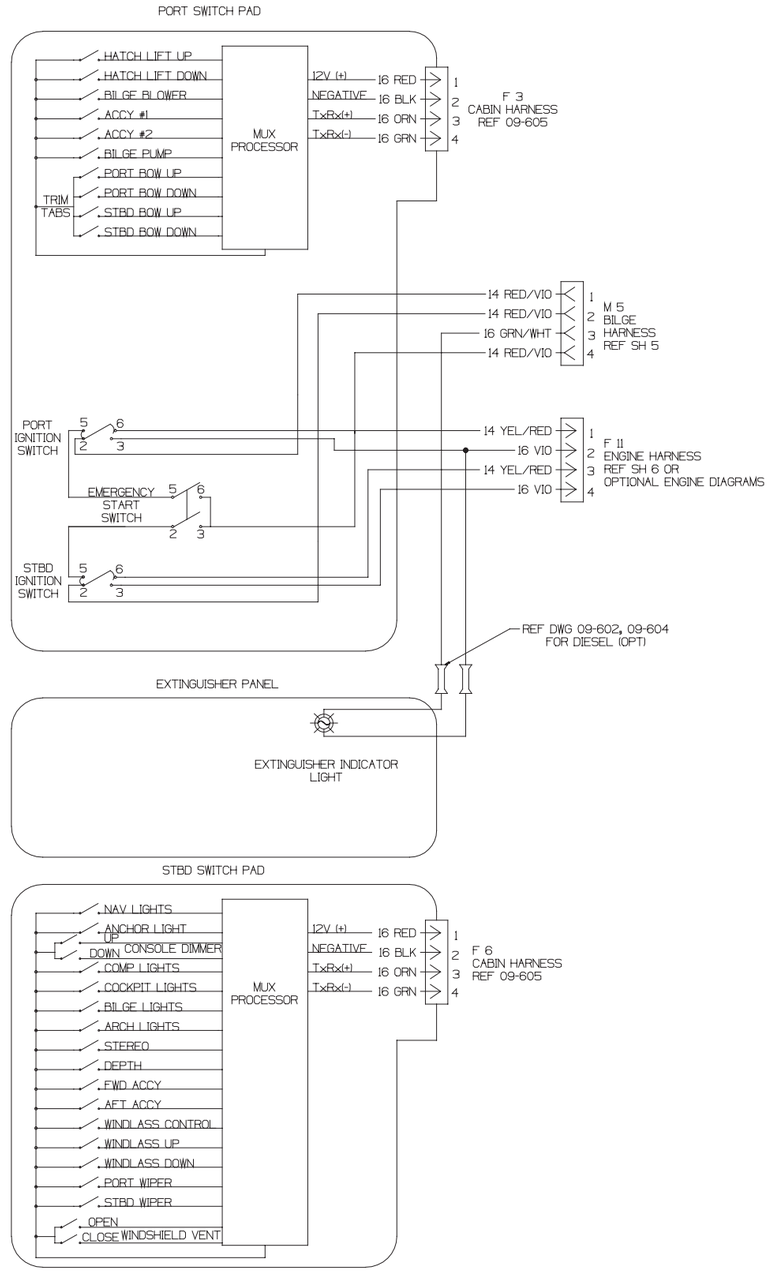
20. 340 DA Electrical Schematics

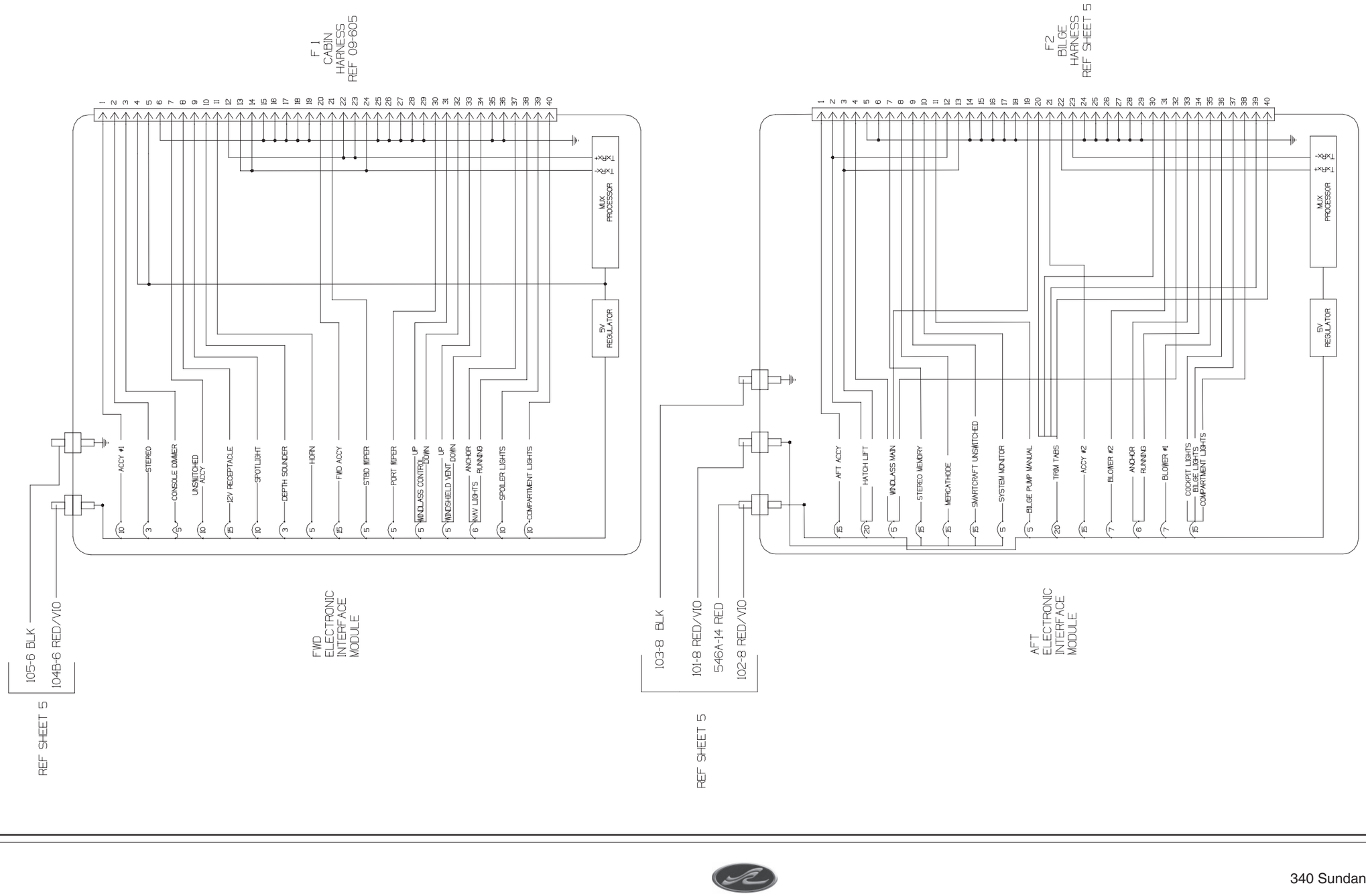
DC Wiring Diagram (1 of 6)
(Fig. 6.29.1) DRAWING NO. 09-601 (1 OF 6), Revision 1



DC Wiring Diagram (2 of 6)
(Fig. 6.29.2) DRAWING NO. 09-601 (2 OF 6)

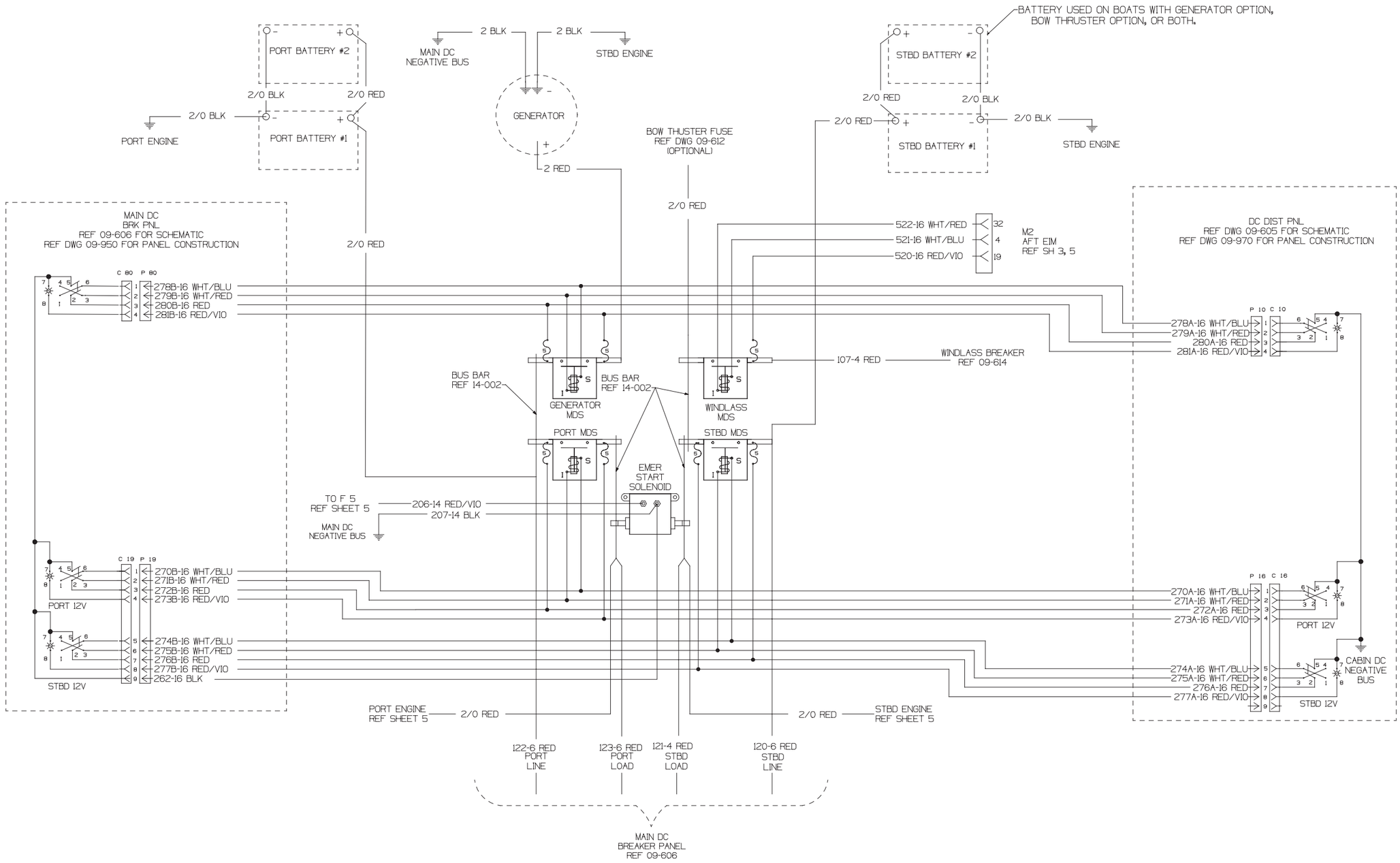


DC Wiring Diagram (3 of 6)
(Fig. 6.30.1) DRAWING NO. 09-601 (3 OF 6), Revision 1



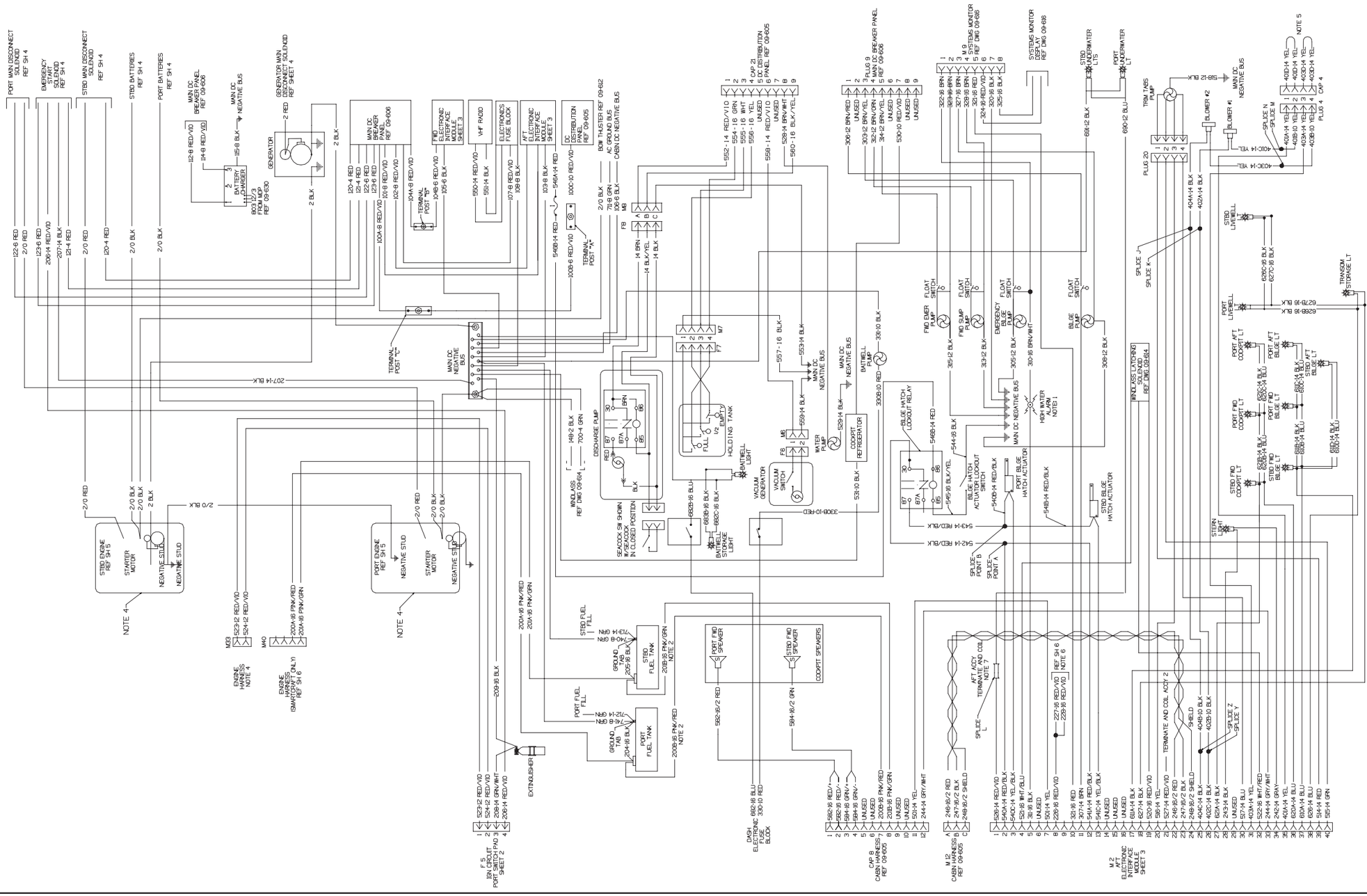
340 DA Electrical Schematics (Continued)

DC Wiring Diagram (4 of 6)
(Fig. 6.31.1) DRAWING NO. 09-601 (4 OF 6)



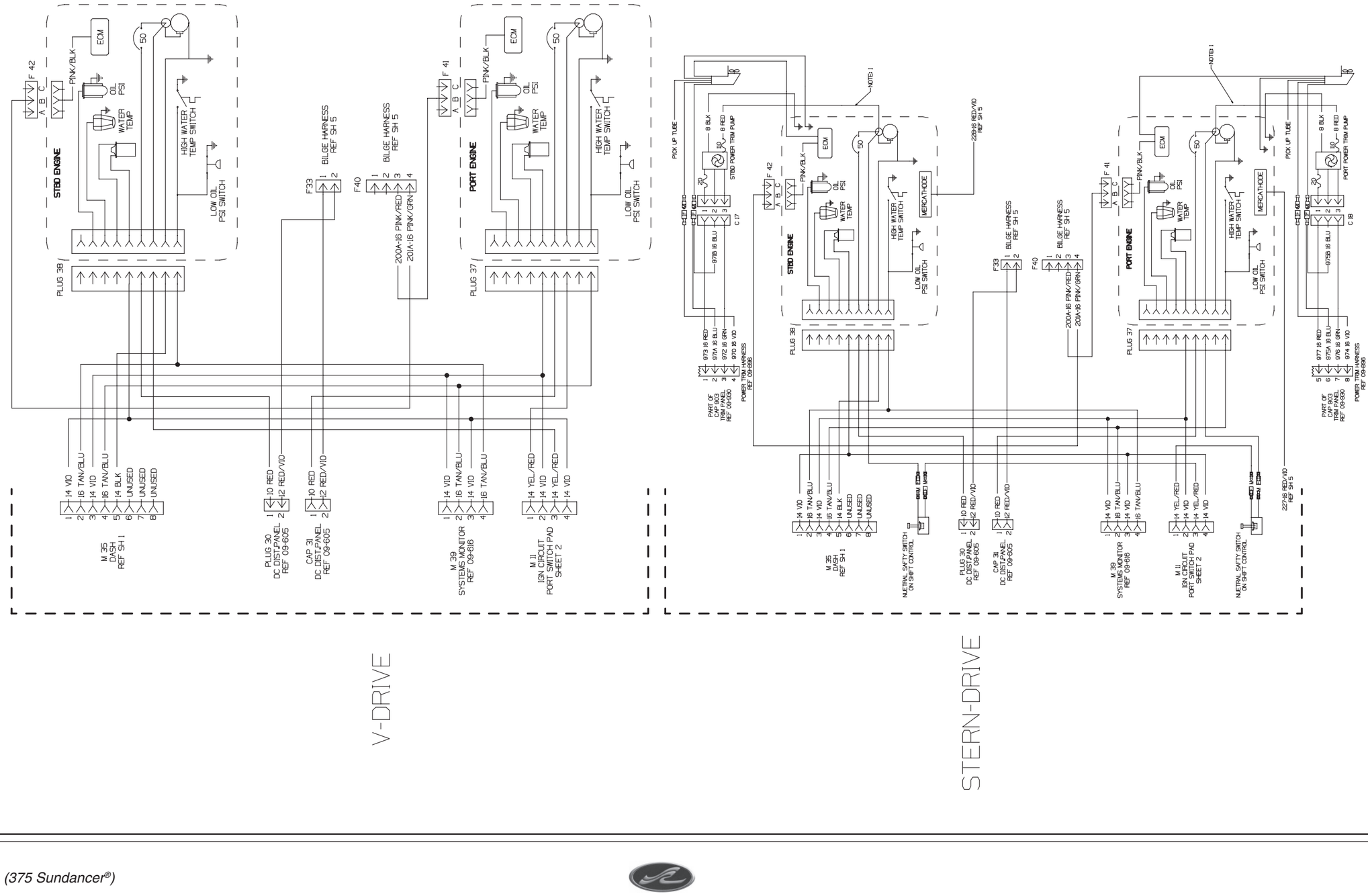
340 DA Electrical Schematics (Continued)

DC Wiring Diagram (5 of 6)
(Fig. 6.32.1) DRAWING NO. 09-601 (5 OF 6) Revision 3



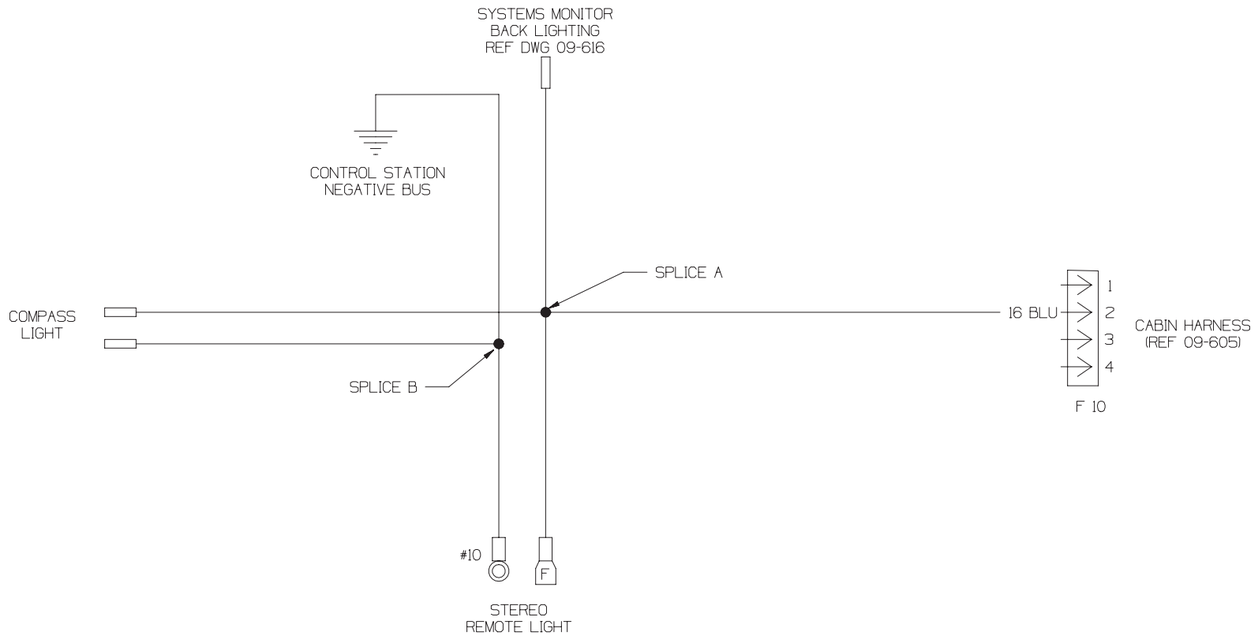
340 DA Electrical Schematics (Continued)

DC Wiring Diagram (6 of 6)
(Fig. 6.33.1) DRAWING NO. 09-601 (6 OF 6) Revision 1



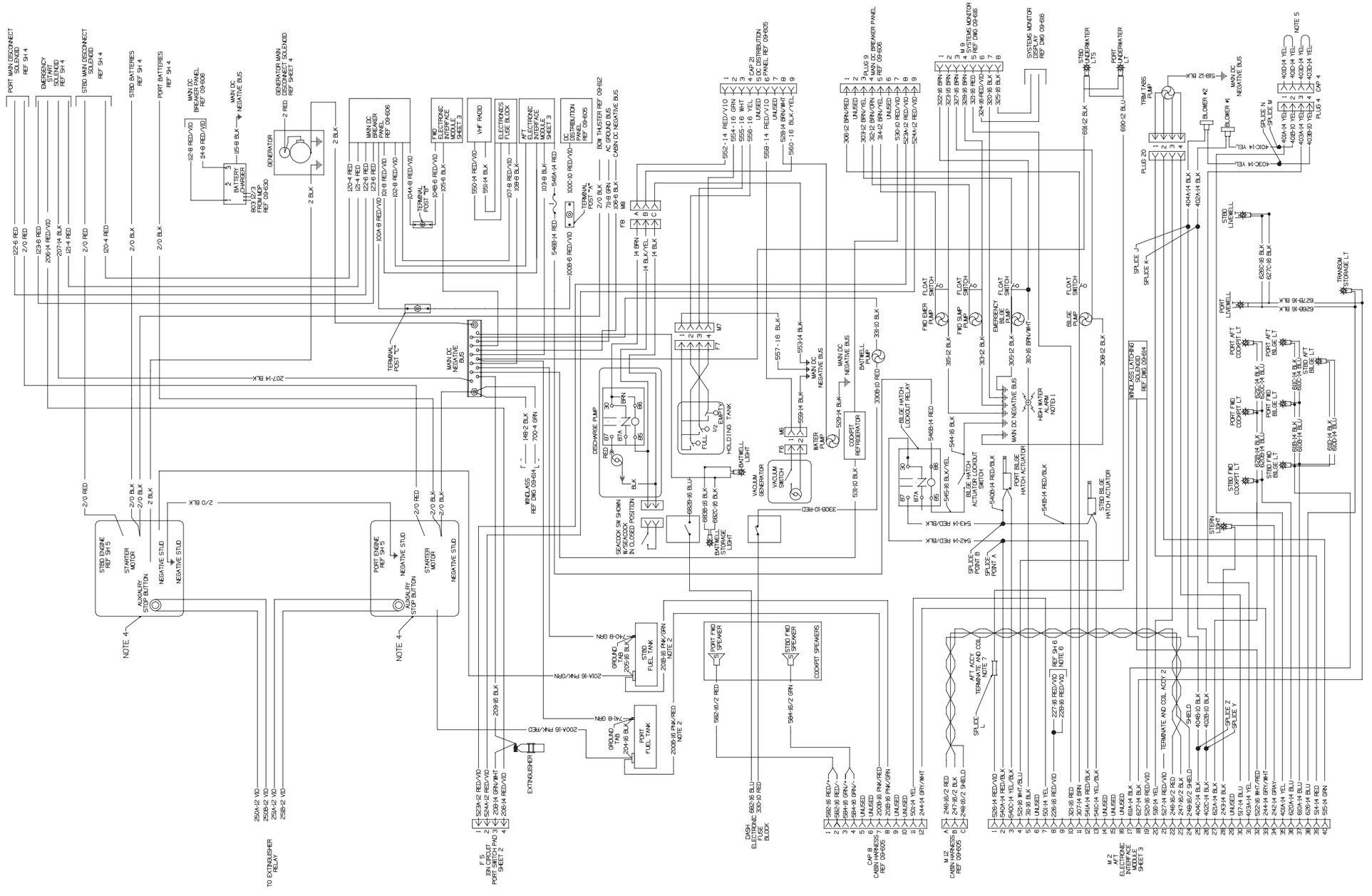
340 DA Electrical Schematics (Continued)

DC Wiring Diagram (Volvo Diesel Option) (1 of 4)
(Fig. 6.34.1) DRAWING NO. 09-602 (1 OF 4) Revision 1



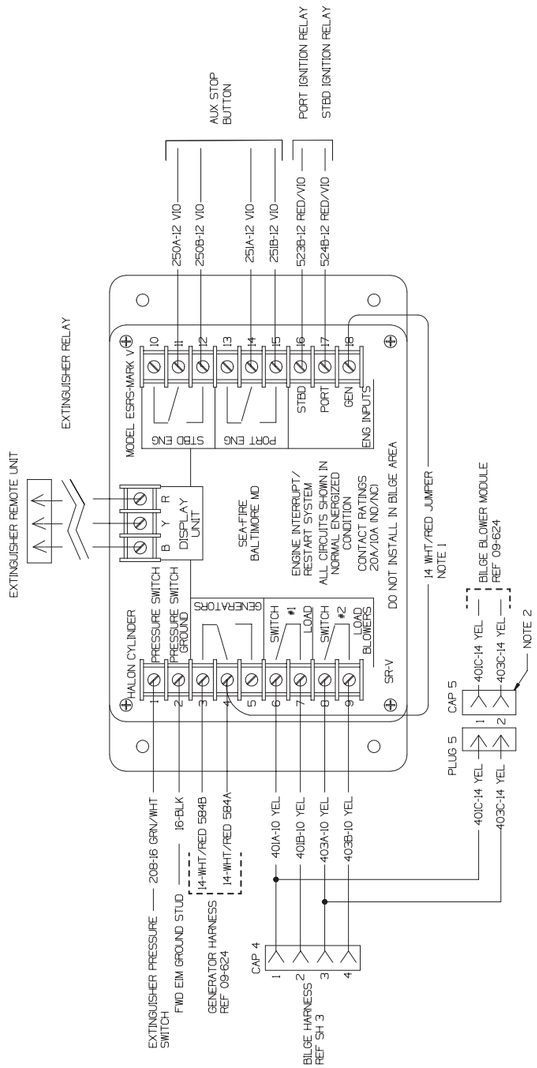
340 DA Electrical Schematics (Continued)

DC Wiring Diagram (Volvo Diesel Option) (2 of 4)
(Fig. 6.35.1) DRAWING NO. 09-602 (2 OF 4) Revision 1

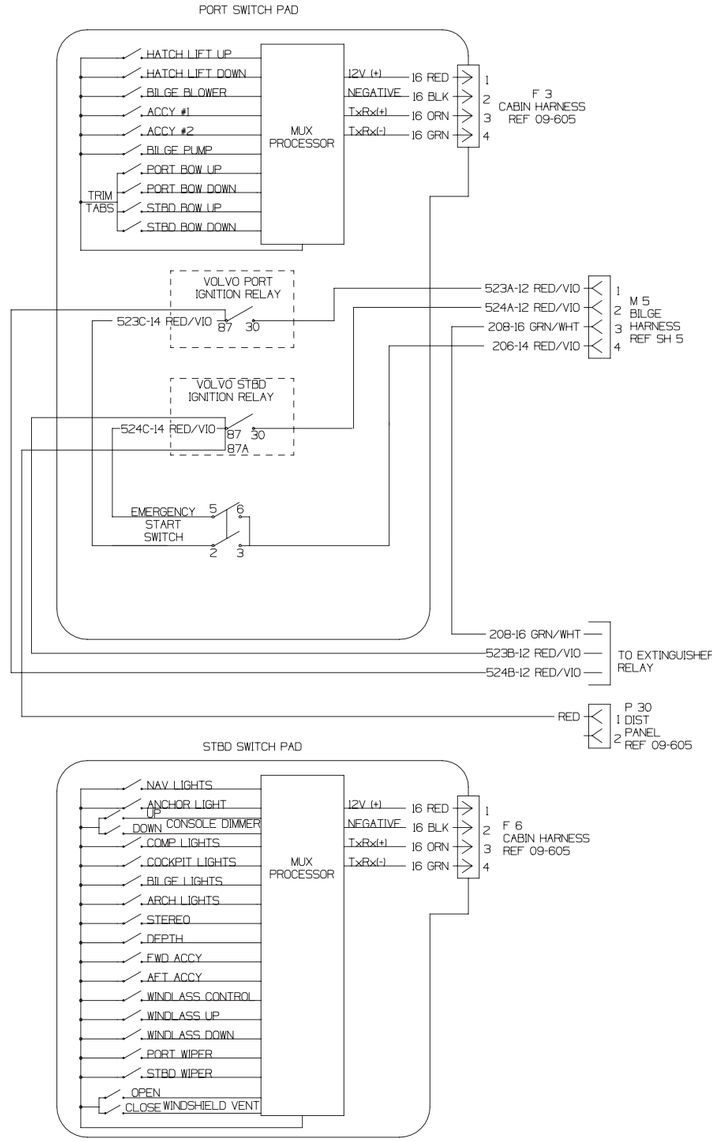


340 DA Electrical Schematics (Continued)

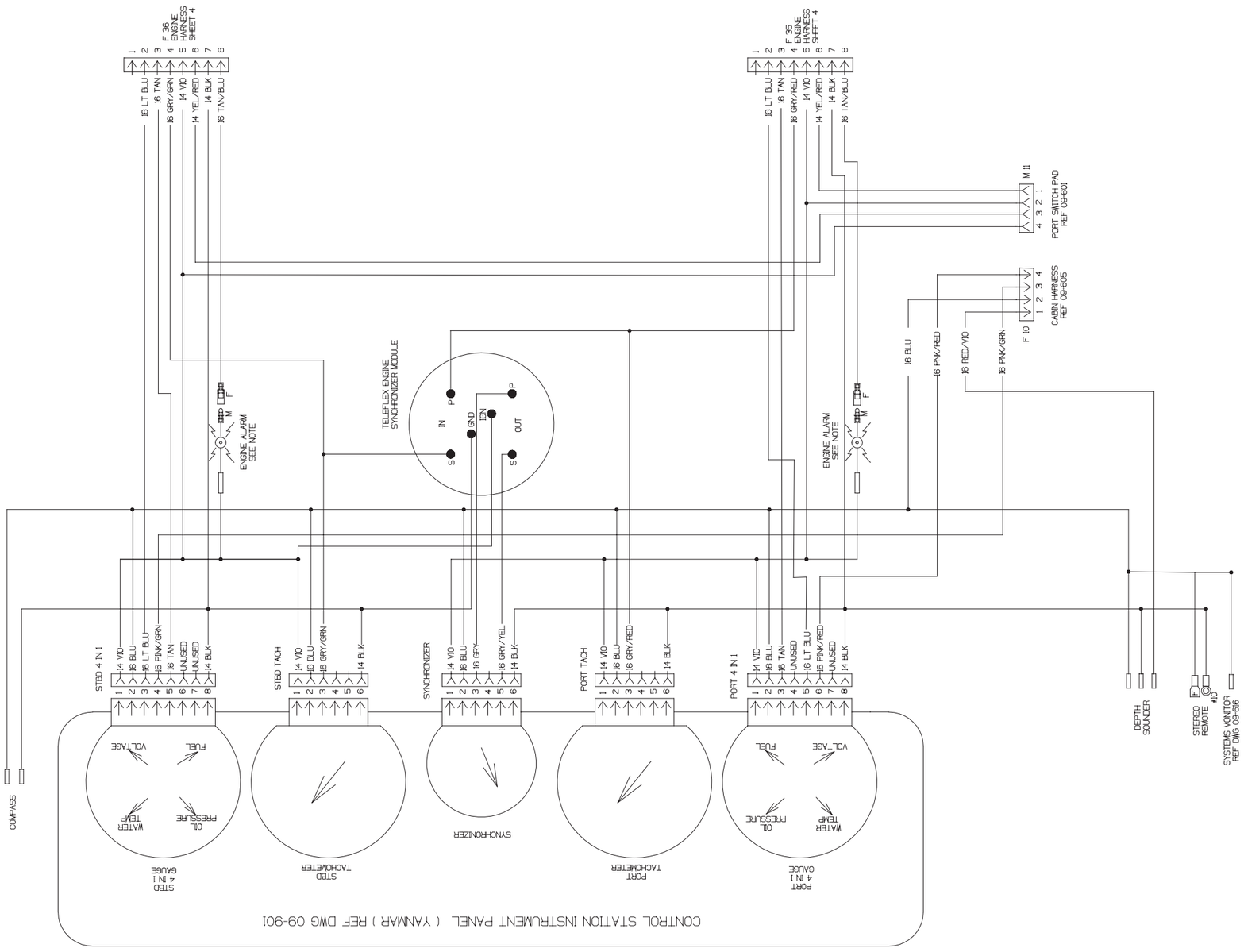
DC Wiring Diagram (Volvo Diesel Option) (3 of 4)
(Fig. 6.36.1) DRAWING NO. 09-602 (3 OF 4) Revision 1



DC Wiring Diagram (Volvo Diesel Option) (4 of 4)
(Fig. 6.36.2) DRAWING NO. 09-602 (4 OF 4) Revision 1

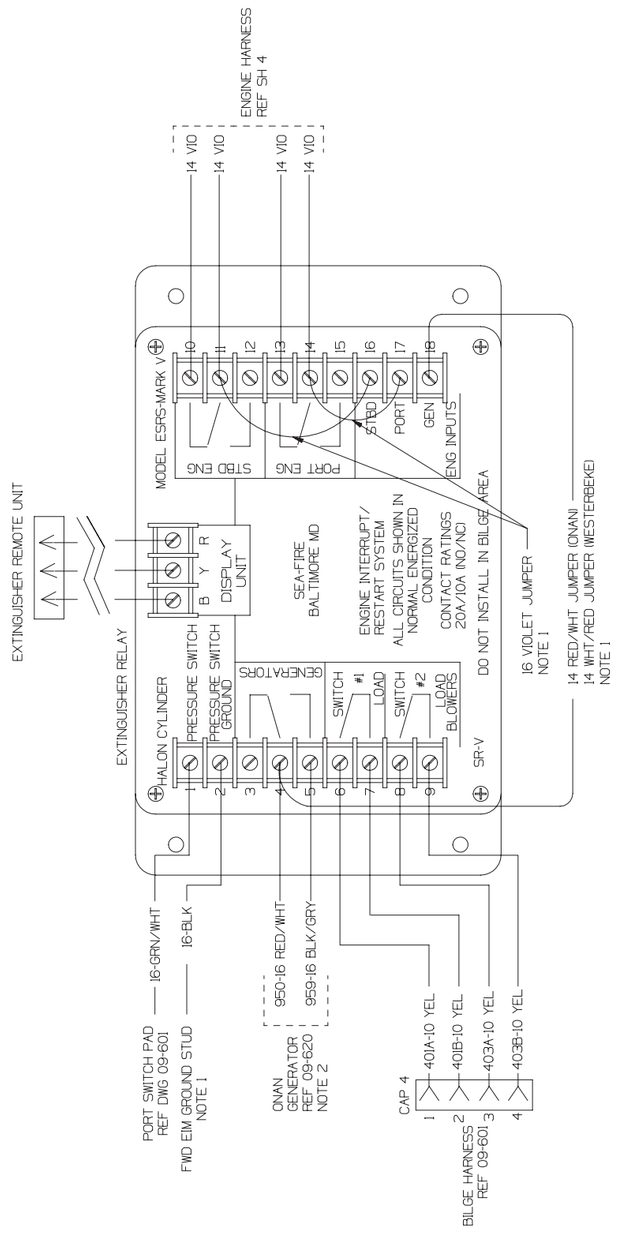


DC Wiring Diagram (Volvo / Yanmar) (1 of 3)
(Fig. 6.37.1) DRAWING NO. 09-604 (1 OF 3)

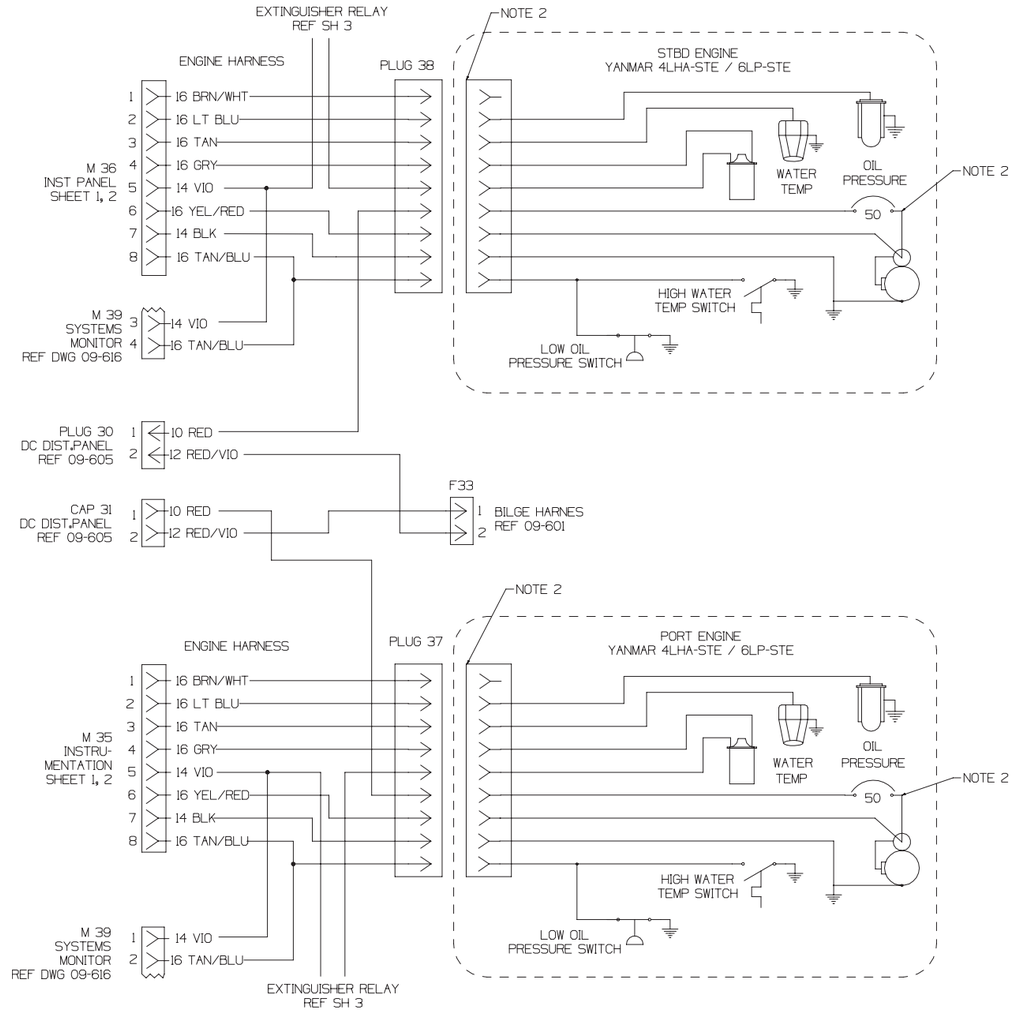


340 DA Electrical Schematics (Continued)

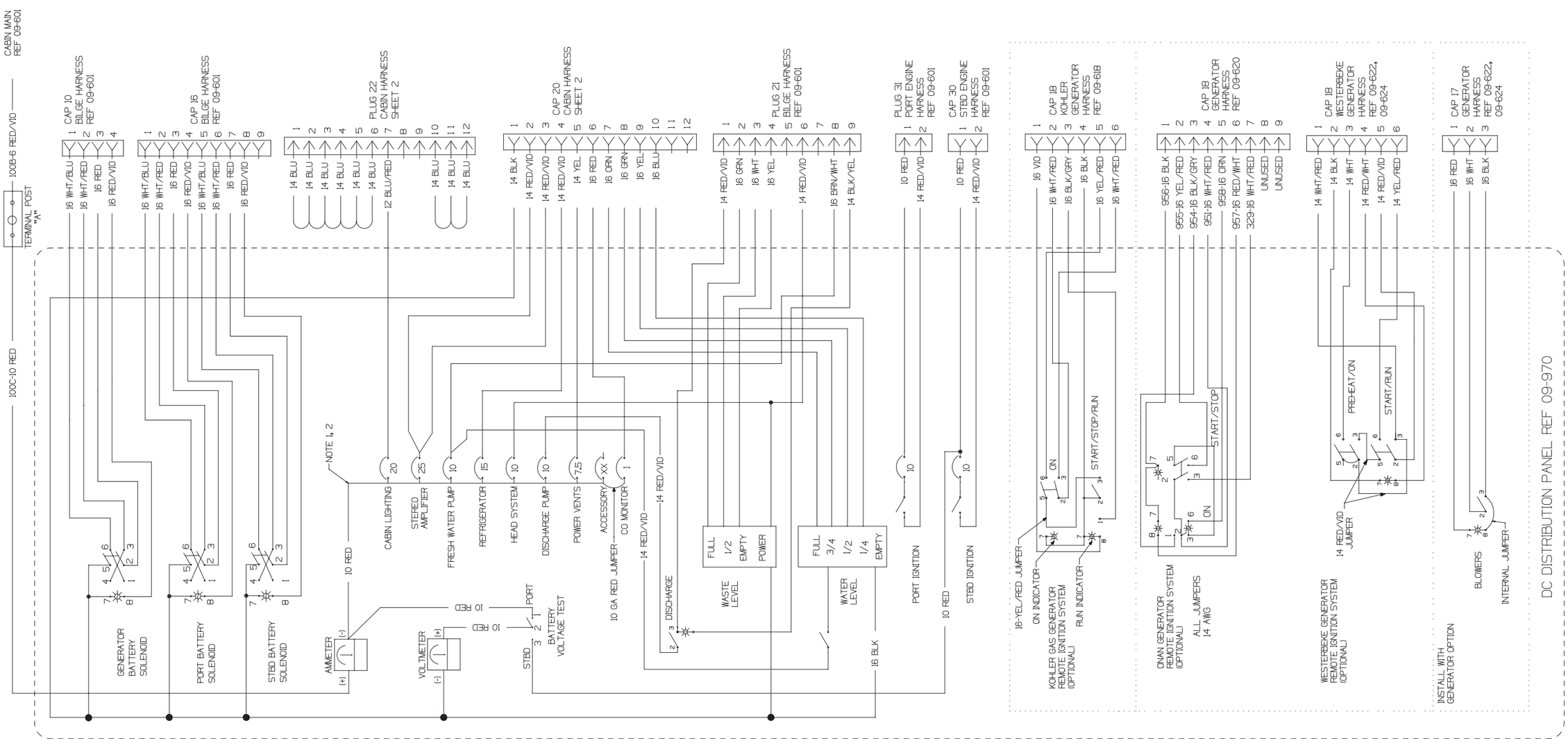
DC Wiring Diagram (Yanmar) (2 of 3)
(Fig. 6.38.1) DRAWING NO. 09-604 (2 OF 3) Revision 1



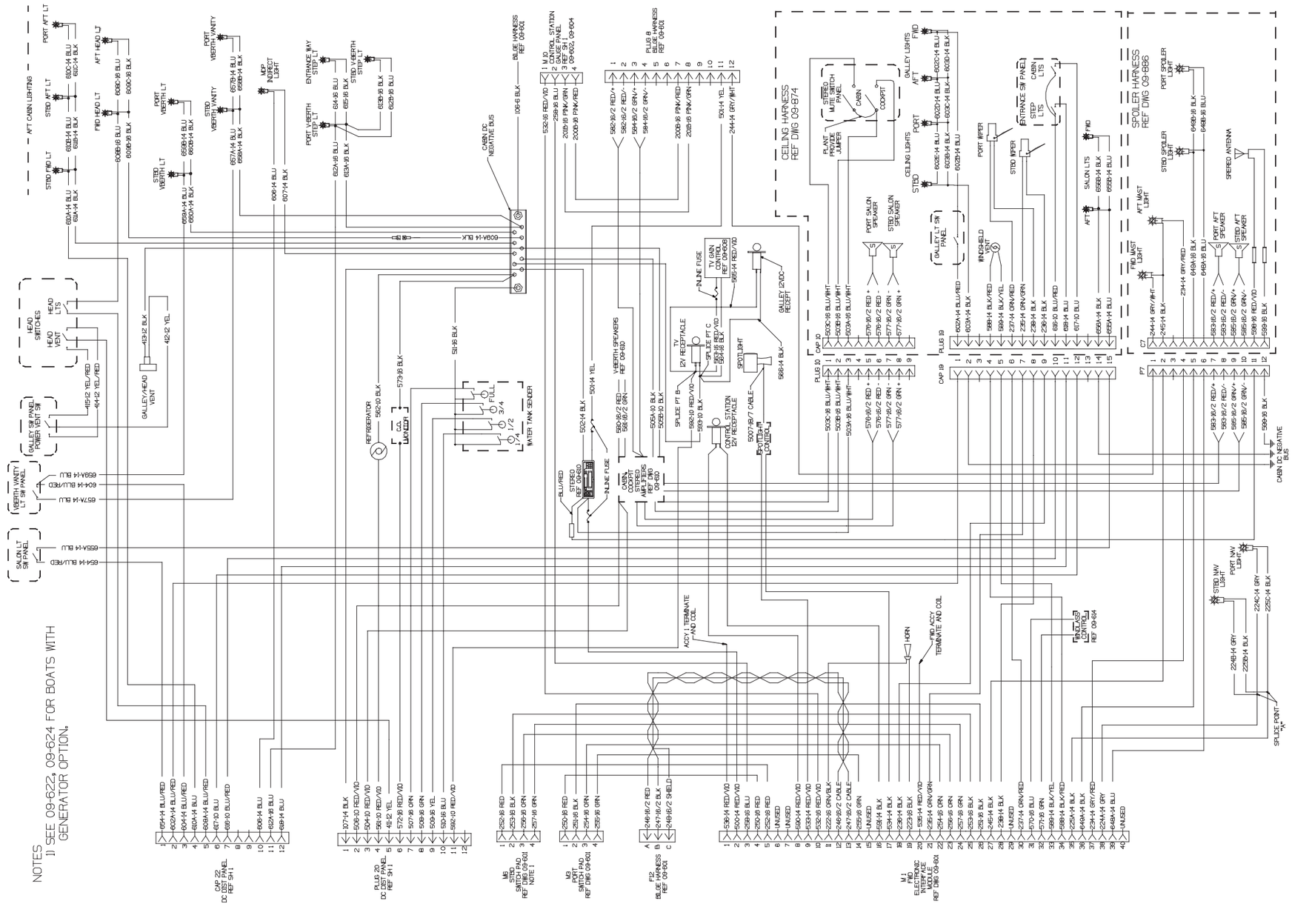
DC Wiring Diagram (Yanmar) (3 of 3)
(Fig. 6.38.2) DRAWING NO. 09-604 (3 OF 3) Revision 1



CABIN DC WIRING DIAGRAM (1 OF 2)
(FIG. 6.39.1) DRAWING NO. 09-605 (1 OF 2) REVISION 3

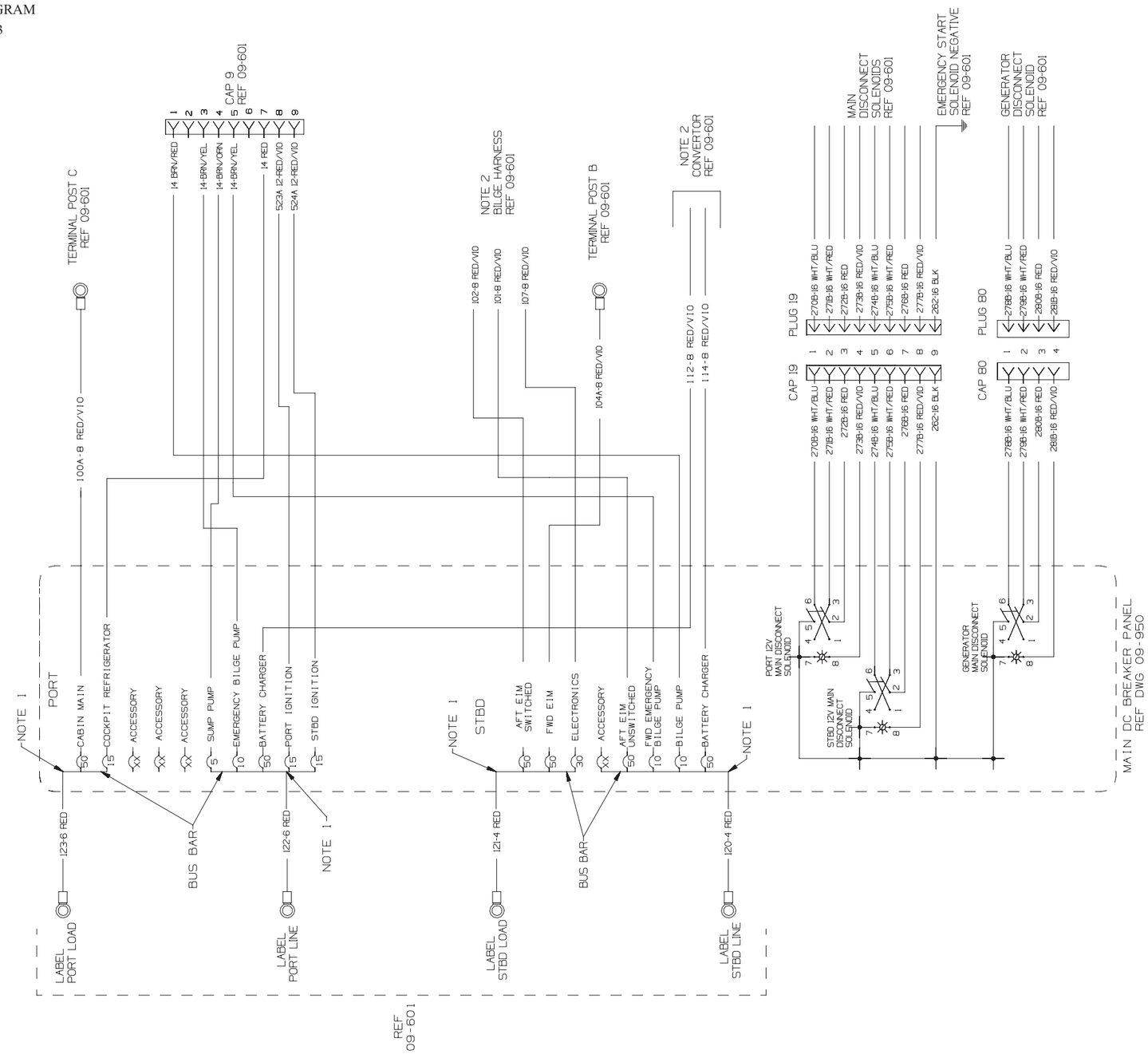


CABIN DC WIRING DIAGRAM (2 OF 2)
(FIG. 6.40.1) DRAWING NO. 09-605 (2 OF 2) REVISION 2



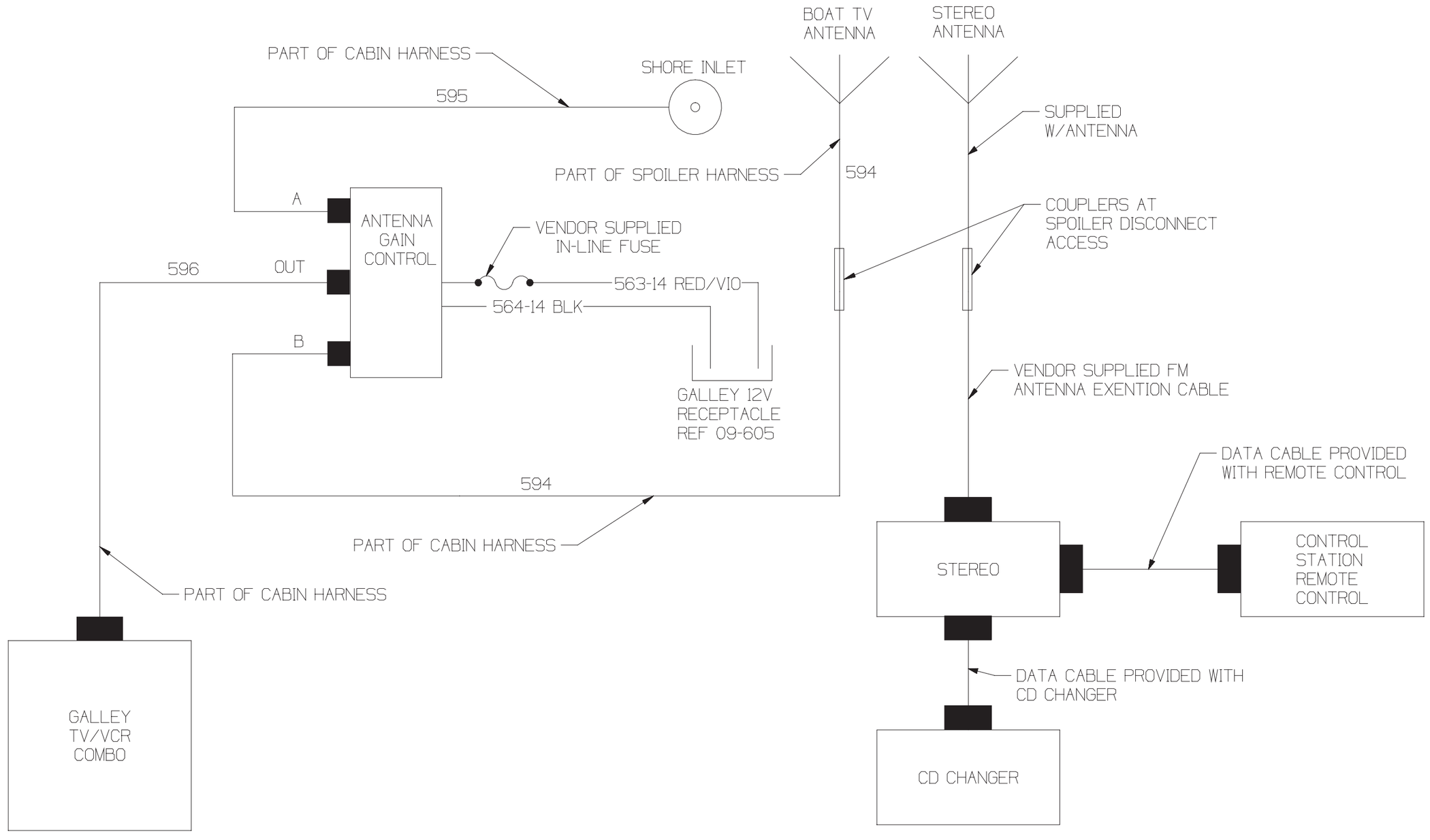
340 DA Electrical Schematics (Continued)

MAIN DC BREAKER PANEL WIRING DIAGRAM
(FIG. 6.41.1) DRAWING NO. 09-606 REVISION 3



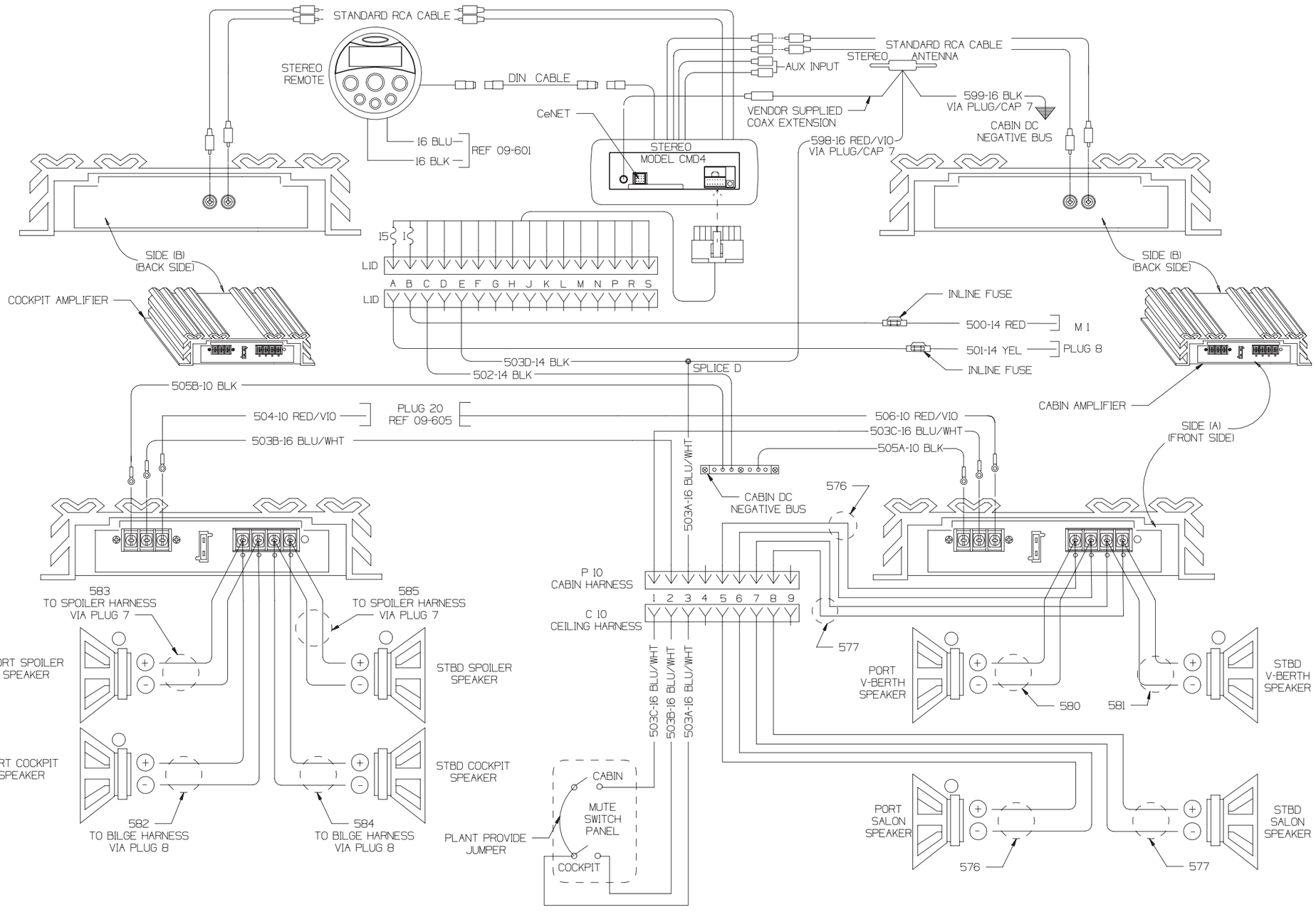
340 DA Electrical Schematics (Continued)

ENTERTAINMENT SYSTEM DIAGRAM
(FIG. 6.42.1) DRAWING NO. 09-608



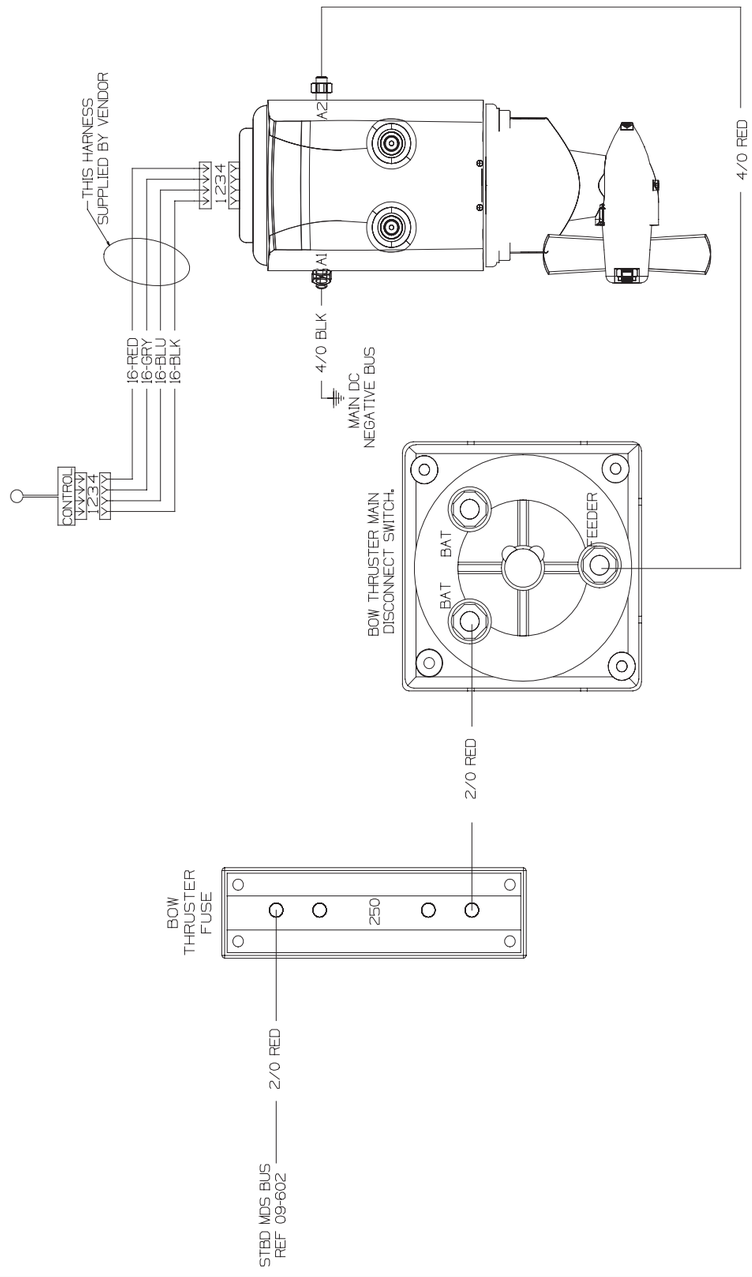
340 DA Electrical Schematics (Continued)

STEREO WIRING DIAGRAM
(FIG. 6.43.1) DRAWING NO. 09-610 REVISION 2

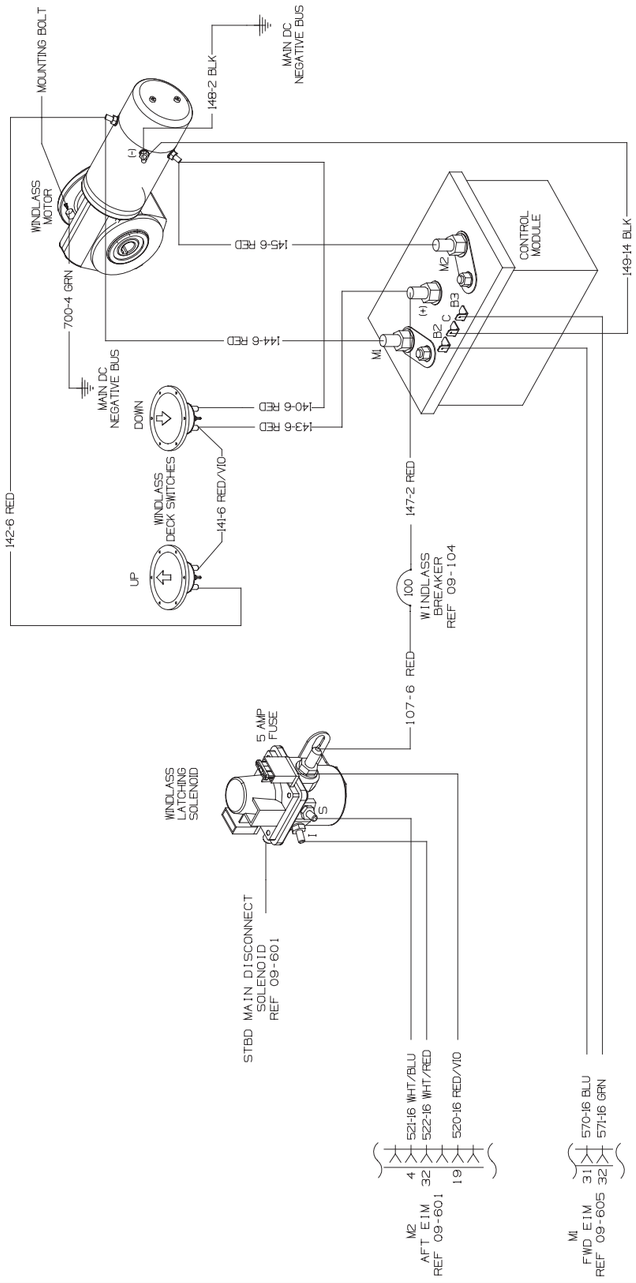


340 DA Electrical Schematics (Continued)

BOW THRUSTER WIRING DIAGRAM (SIDE POWER SP-55)
(FIG. 6.44.1) DRAWING NO. 09-612

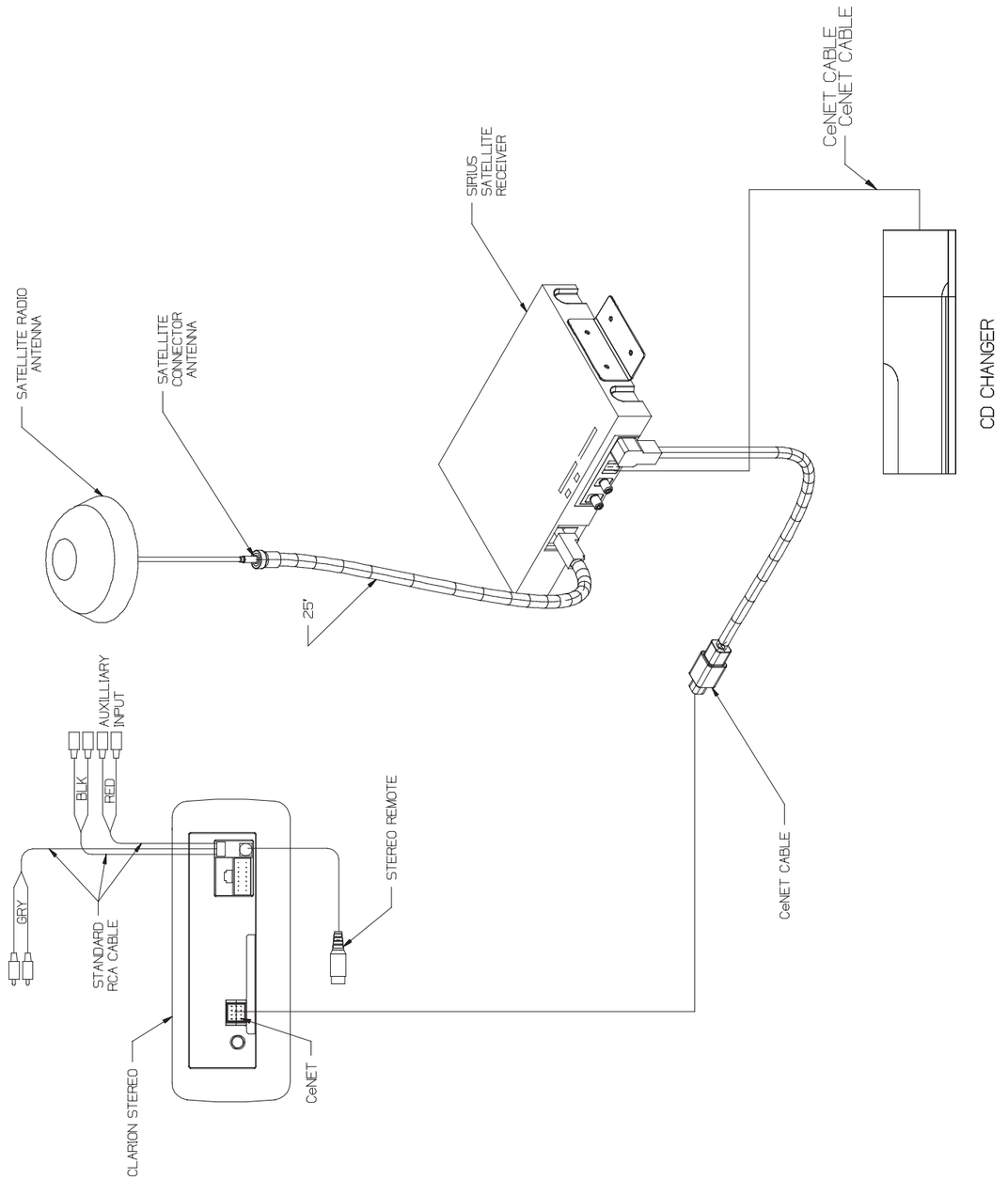


WINDLASS WIRING SCHEMATIC (LOFRANS PROGRESS II)
(FIG. 6.44.2) DRAWING NO. 09-614

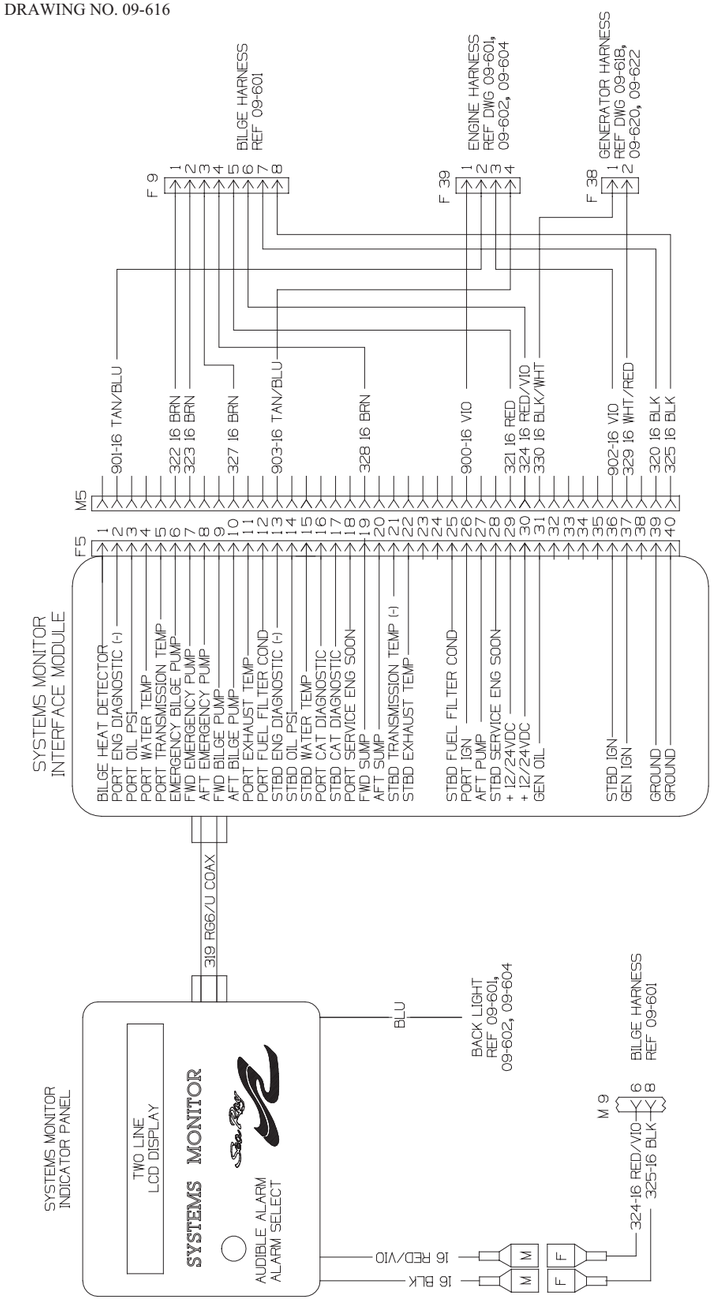


340 DA Electrical Schematics (Continued)

SATELLITE STEREO SYSTEM (OPTION)
(FIG. 6.45.1) DRAWING NO. 09-615

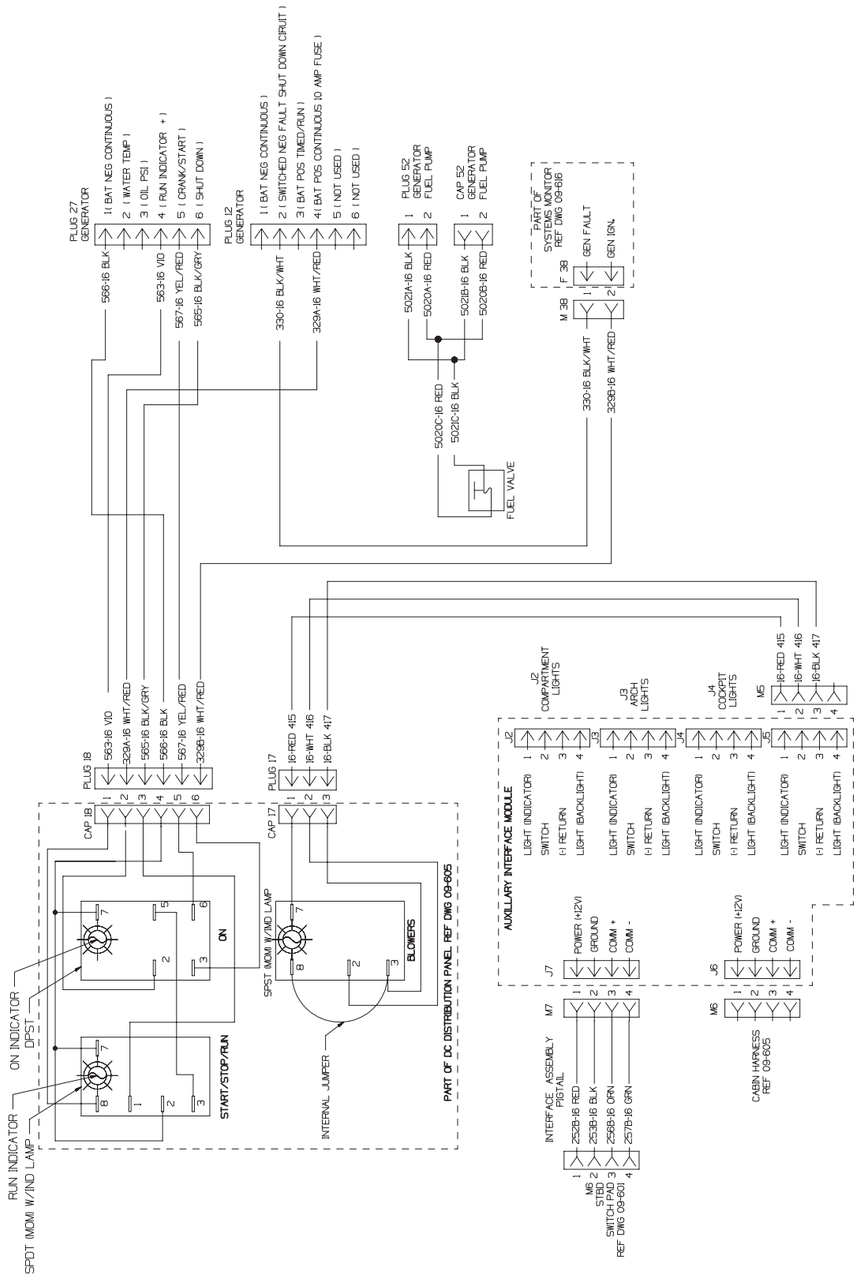


SYSTEMS MONITOR WIRING DIAGRAM
(FIG. 6.45.2) DRAWING NO. 09-616

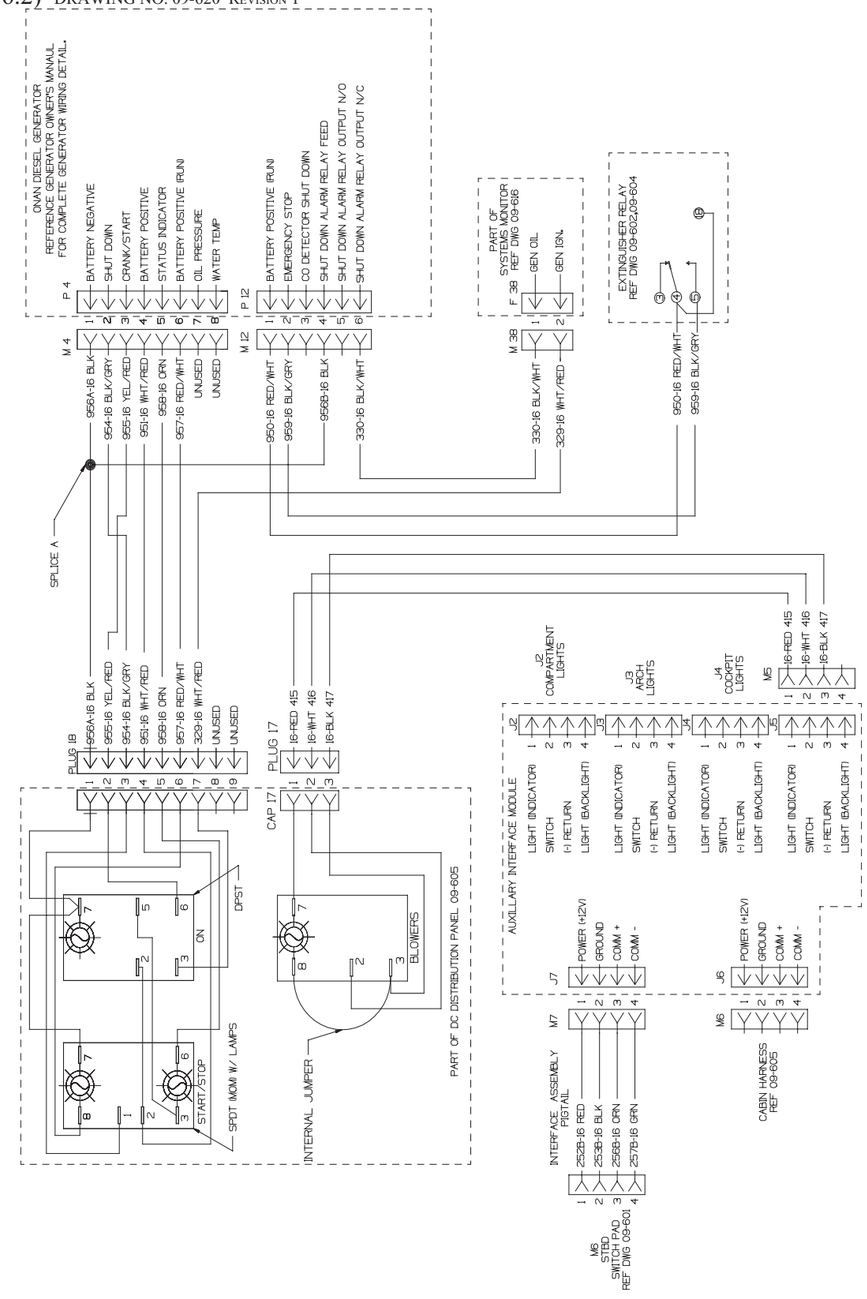


340 DA Electrical Schematics (Continued)

KOHLER GENERATOR WIRING DIAGRAM (220V)
(FIG. 6.46.1) DRAWING NO. 09-618 REVISION 1

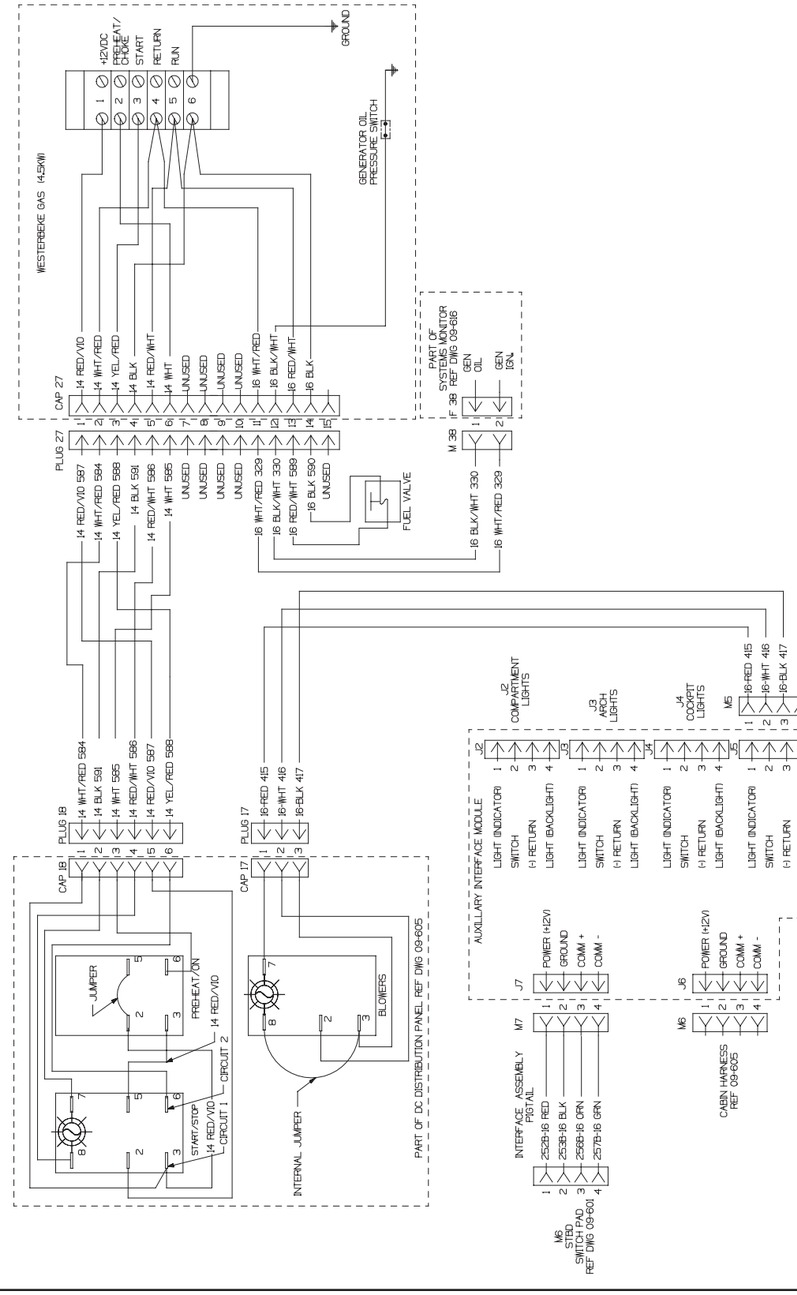


ONAN GENERATOR WIRING DIAGRAM
(FIG. 6.46.2) DRAWING NO. 09-620 REVISION 1

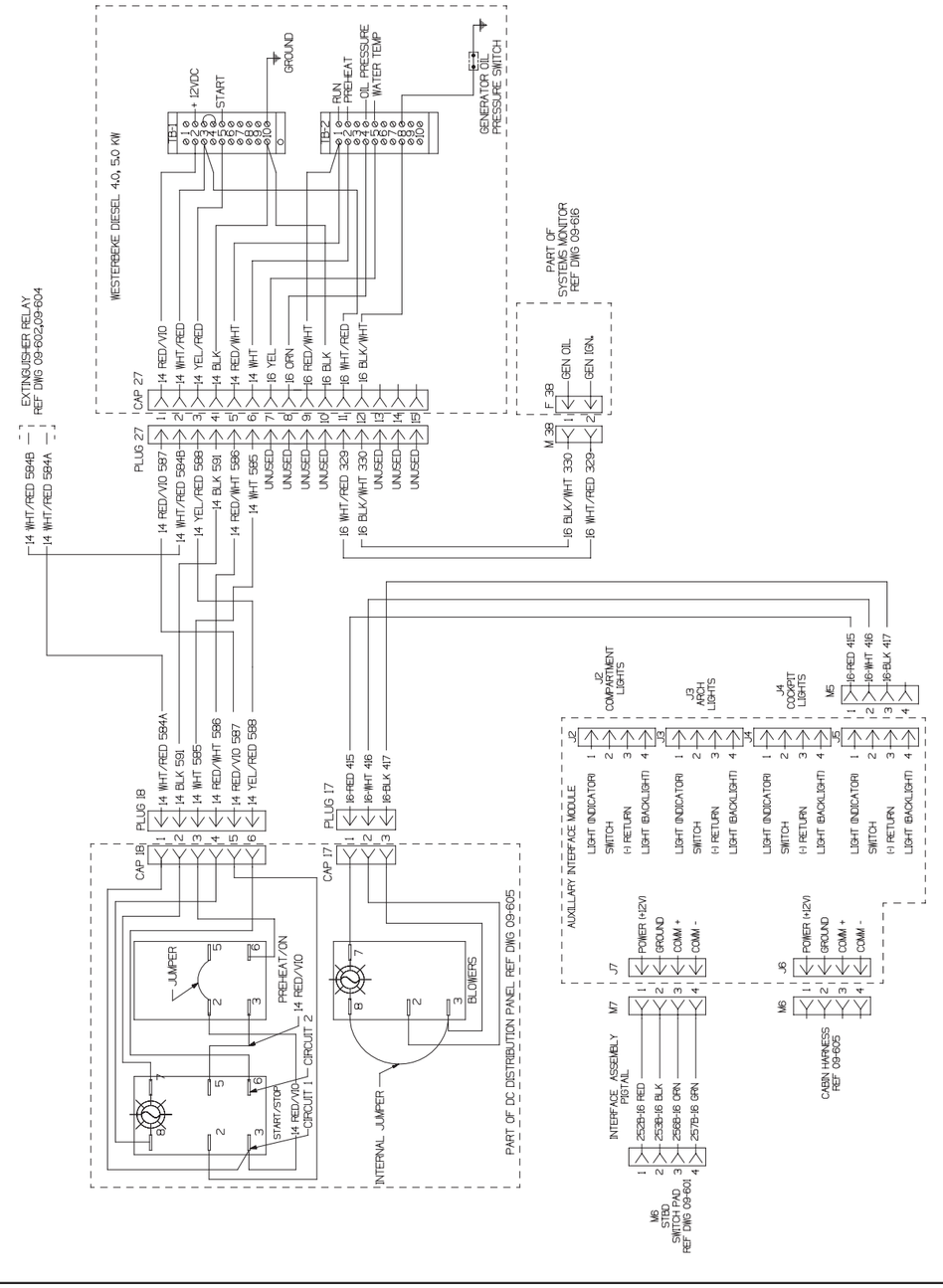


340 DA Electrical Schematics (Continued)

WESTERBEKE (GAS) GENERATOR WIRING DIAGRAM (4.5 KW)
(FIG. 6.47.1) DRAWING NO. 09-622

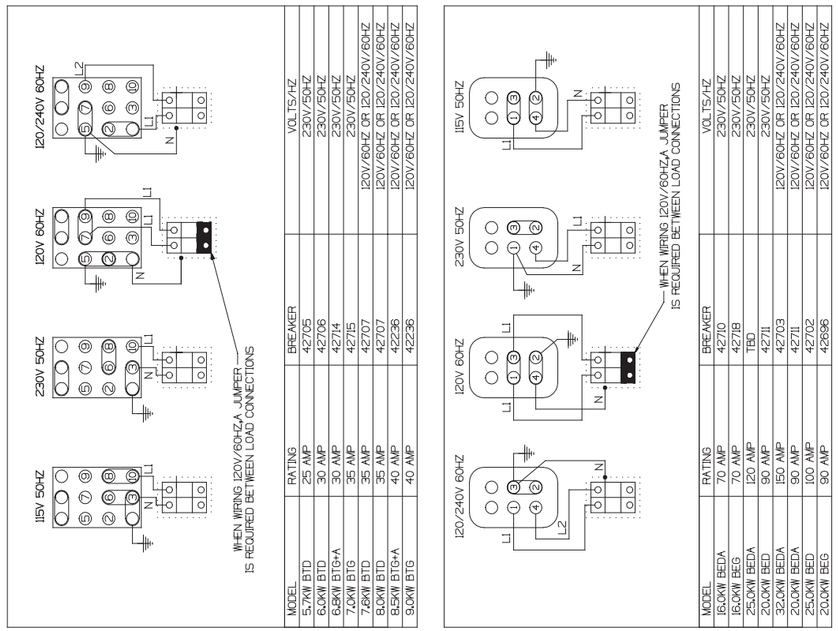


WESTERBEKE (DIESEL) GENERATOR WIRING DIGRAM
(FIG. 6.47.2) DRAWING NO. 09-624



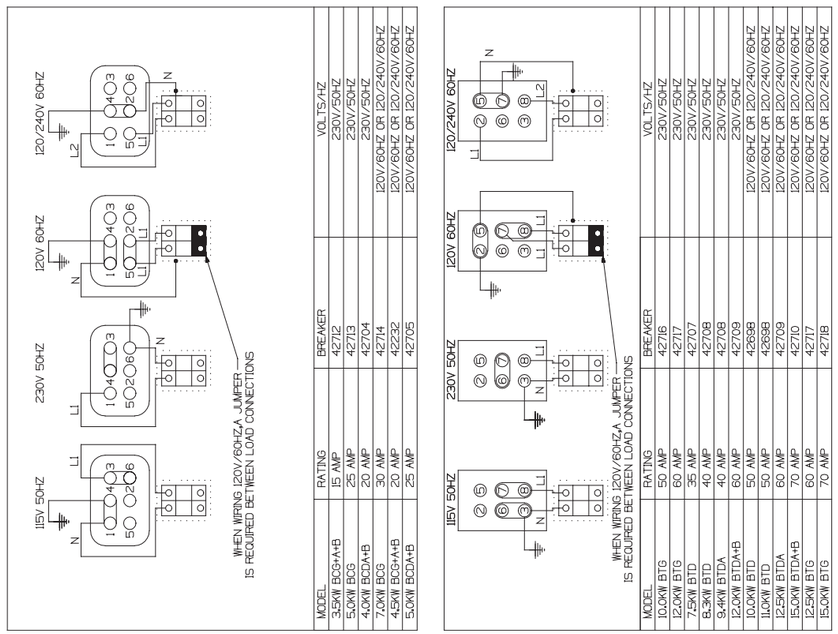
340 DA Electrical Schematics (Continued)

Westerbeke Generator High Voltage Wiring (Fig. 6.48.1) drawing no. 09-626



MODEL	RATING	BREAKER	VOLTS/HZ
5.7KW BTD	25 AMP	42705	230V/50HZ
6.0KW BTD	30 AMP	42706	230V/50HZ
6.6KW BTG+A	30 AMP	42714	230V/50HZ
7.0KW BTG	35 AMP	42715	230V/50HZ
7.6KW BTD	35 AMP	42707	120V/60HZ OR 120/240V/60HZ
8.0KW BTD	35 AMP	42707	120V/60HZ OR 120/240V/60HZ
8.5KW BTG+A	40 AMP	42236	120V/60HZ OR 120/240V/60HZ
9.0KW BTG	40 AMP	42236	120V/60HZ OR 120/240V/60HZ

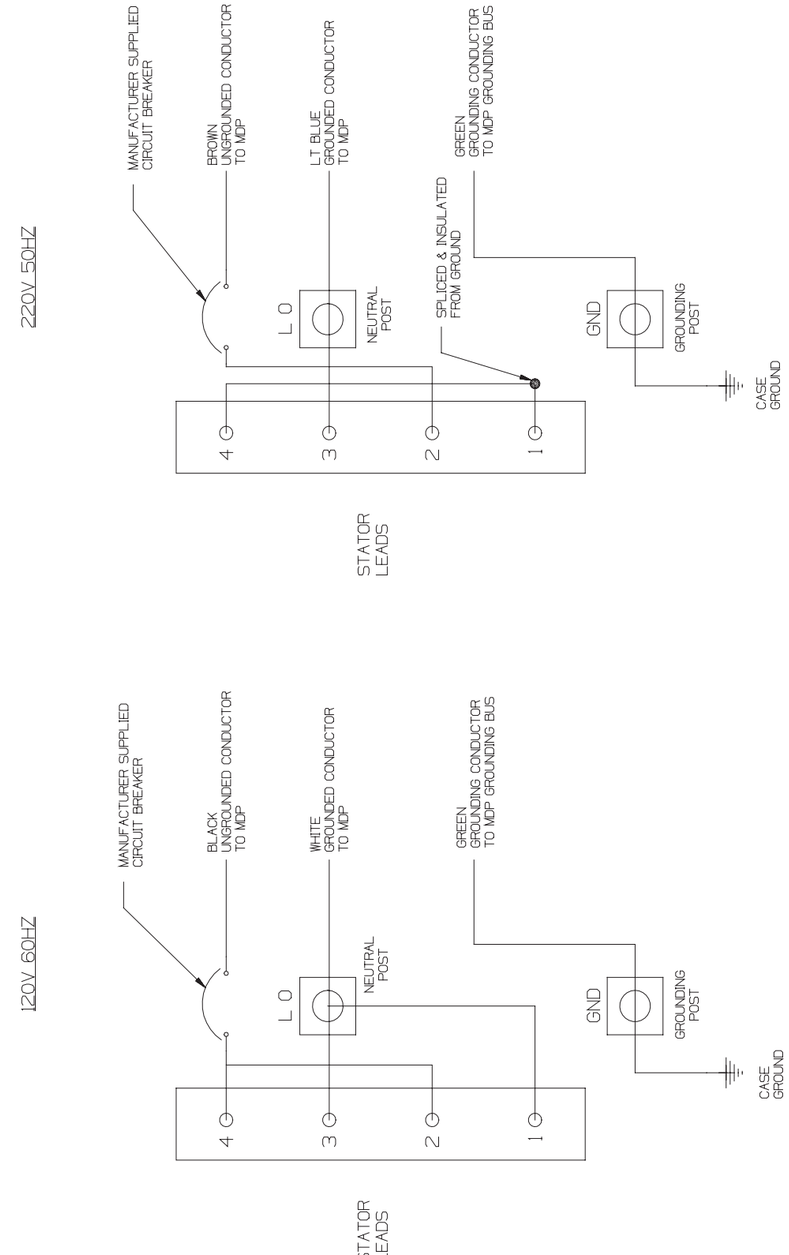
MODEL	RATING	BREAKER	VOLTS/HZ
16.0KW BEDA	70 AMP	42710	230V/50HZ
16.0KW BEG	70 AMP	42718	230V/50HZ
25.0KW BEDA	120 AMP	TBD	230V/50HZ
20.0KW BED	90 AMP	42711	230V/50HZ
32.0KW BEDA	150 AMP	42703	120V/60HZ OR 120/240V/60HZ
20.0KW BEDA	90 AMP	42711	120V/60HZ OR 120/240V/60HZ
25.0KW BED	100 AMP	42702	120V/60HZ OR 120/240V/60HZ
20.0KW BEG	90 AMP	42696	120V/60HZ OR 120/240V/60HZ



MODEL	RATING	BREAKER	VOLTS/HZ
3.5KW BCG+A+B	15 AMP	42712	230V/50HZ
5.0KW BCG	25 AMP	42713	230V/50HZ
4.0KW BCDA+B	20 AMP	42704	230V/50HZ
7.0KW BCG	30 AMP	42714	120V/60HZ OR 120/240V/60HZ
4.5KW BCG+A+B	20 AMP	42232	120V/60HZ OR 120/240V/60HZ
5.0KW BCDA+B	25 AMP	42705	120V/60HZ OR 120/240V/60HZ

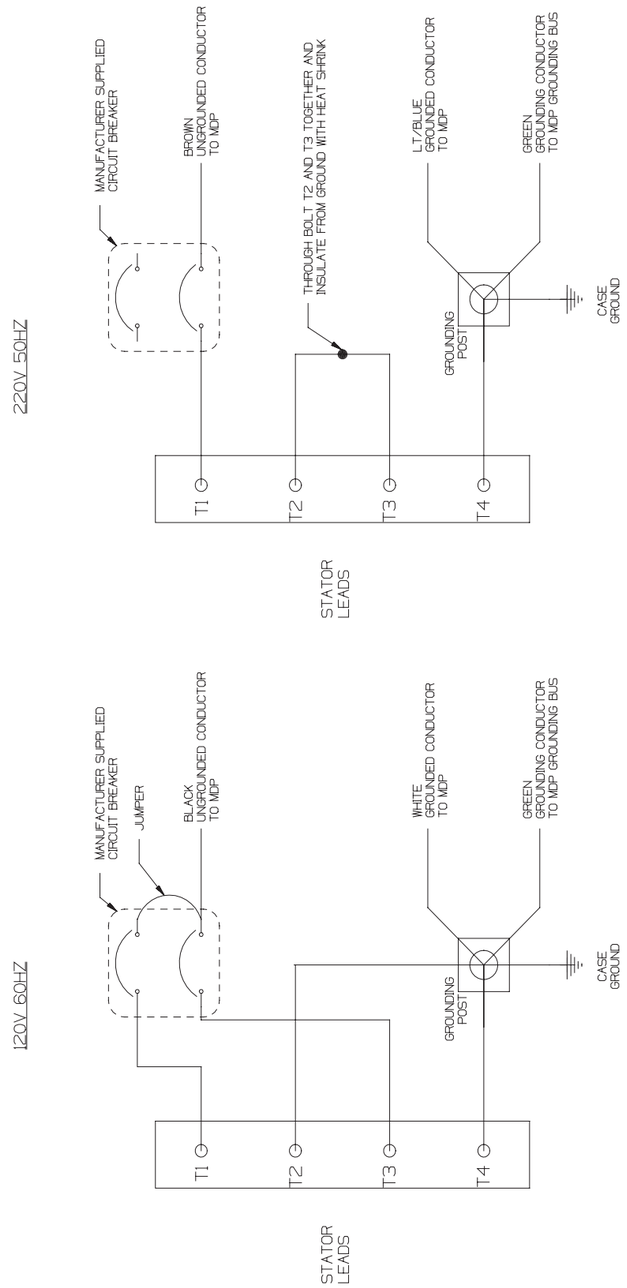
MODEL	RATING	BREAKER	VOLTS/HZ
10.0KW BTG	50 AMP	42716	230V/50HZ
12.0KW BTG	60 AMP	42717	230V/50HZ
7.5KW BTD	35 AMP	42707	230V/50HZ
8.3KW BTD	40 AMP	42708	230V/50HZ
9.4KW BTDA	40 AMP	42708	230V/50HZ
12.0KW BTDA+B	60 AMP	42709	230V/50HZ
10.0KW BTD	50 AMP	42698	120V/60HZ OR 120/240V/60HZ
11.0KW BTD	50 AMP	42698	120V/60HZ OR 120/240V/60HZ
12.5KW BTDA	60 AMP	42709	120V/60HZ OR 120/240V/60HZ
15.0KW BTDA+B	70 AMP	42710	120V/60HZ OR 120/240V/60HZ
12.5KW BTG	60 AMP	42717	120V/60HZ OR 120/240V/60HZ
15.0KW BTG	70 AMP	42718	120V/60HZ OR 120/240V/60HZ

Kohler Generator High Voltage Wiring Diagram (Fig. 6.48.2) drawing no. 09-627

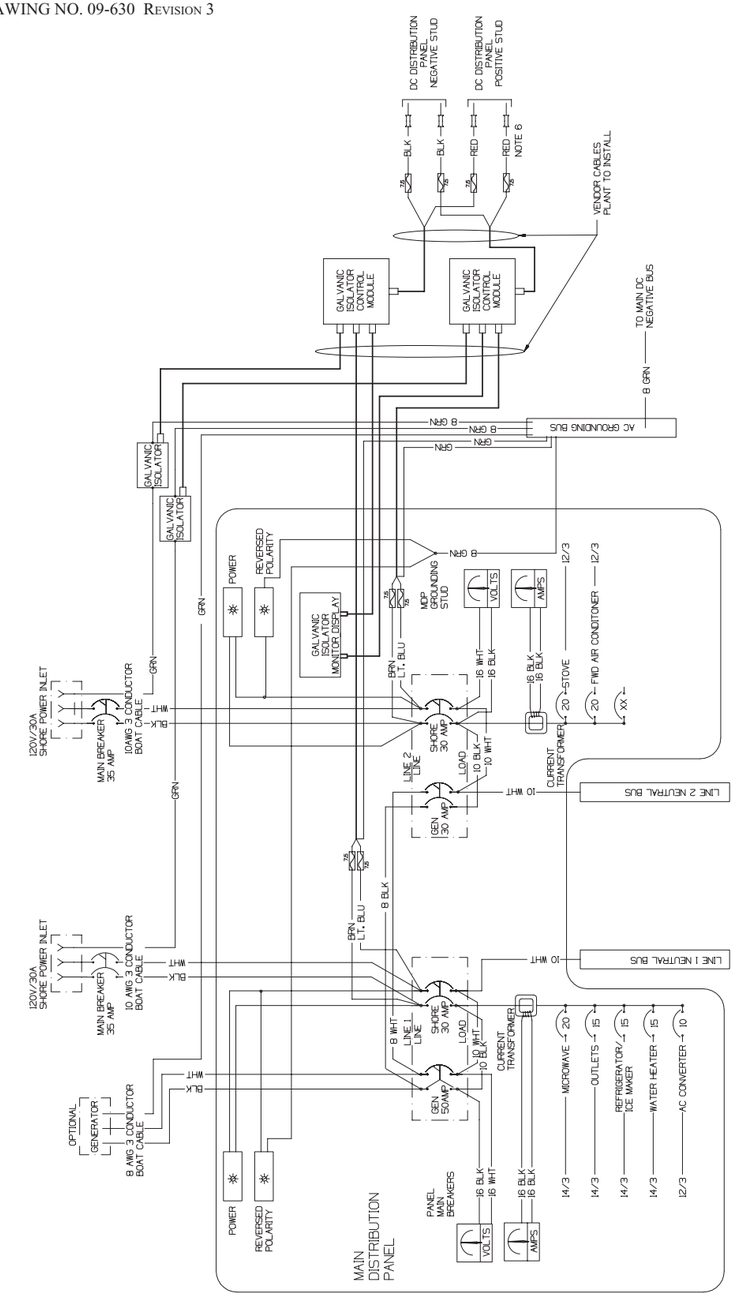


340 DA Electrical Schematics (Continued)

Onan Generator High Voltage Wiring
(Fig. 6.49.1) DRAWING NO. 09-628

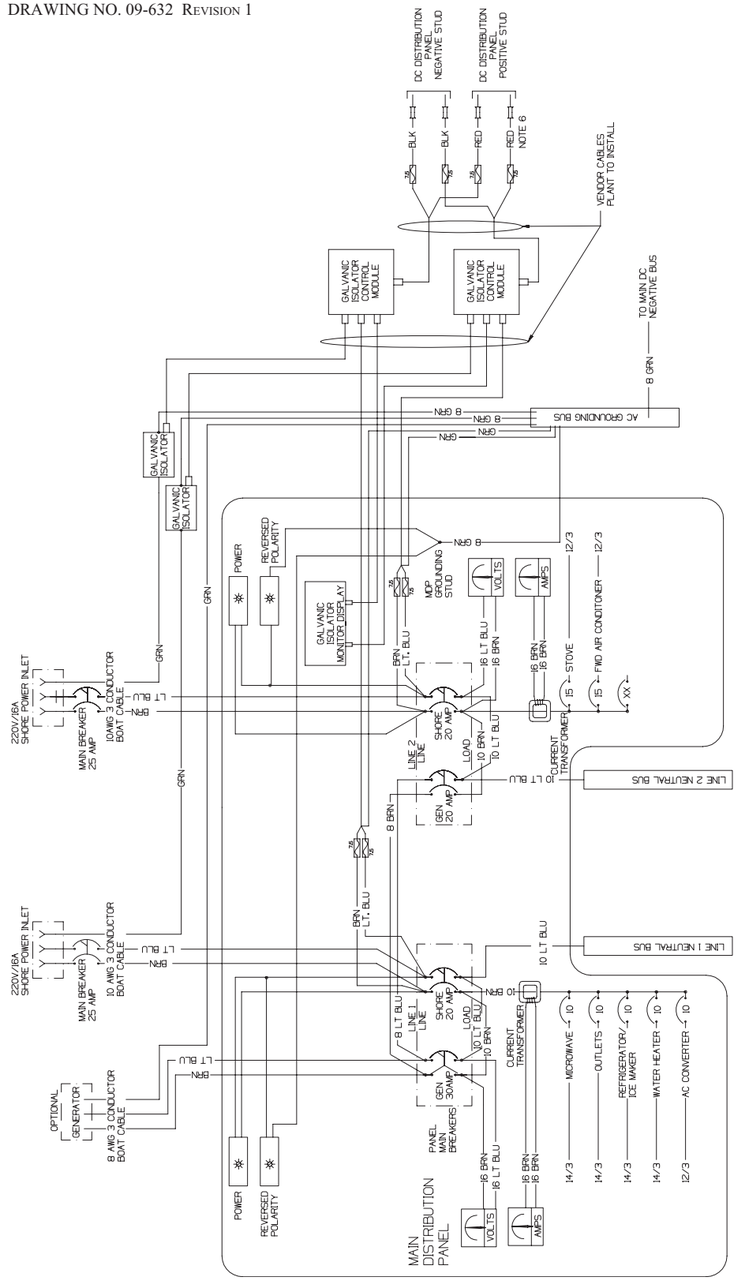


Main Distribution Panel Wiring Diagram (120V)
(Fig. 6.49.2) DRAWING NO. 09-630 Revision 3

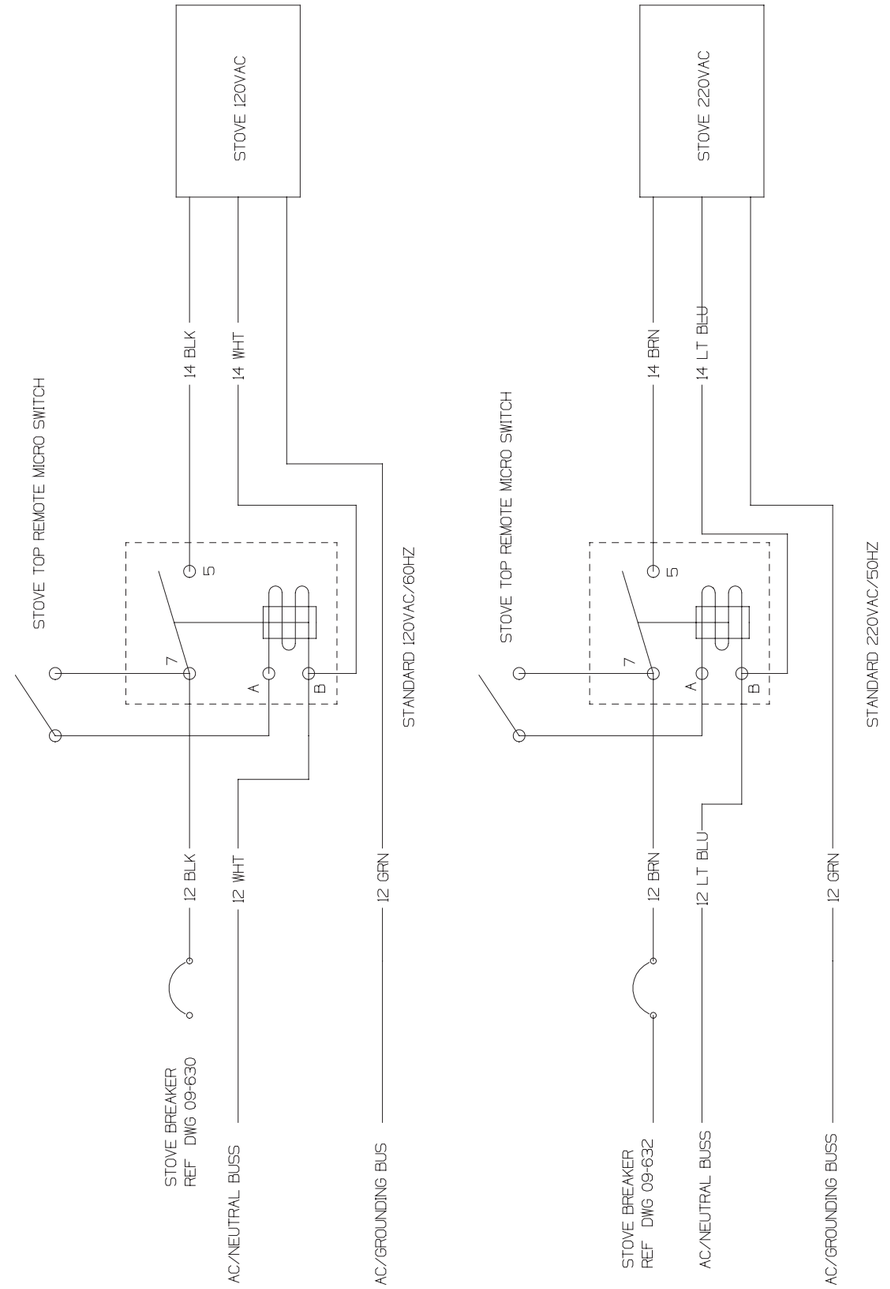


340 DA Electrical Schematics (Continued)

MAIN DISTRIBUTION PANEL WIRING DIAGRAM (220V/50Hz)
(FIG. 6.50.1) DRAWING NO. 09-632 REVISION 1

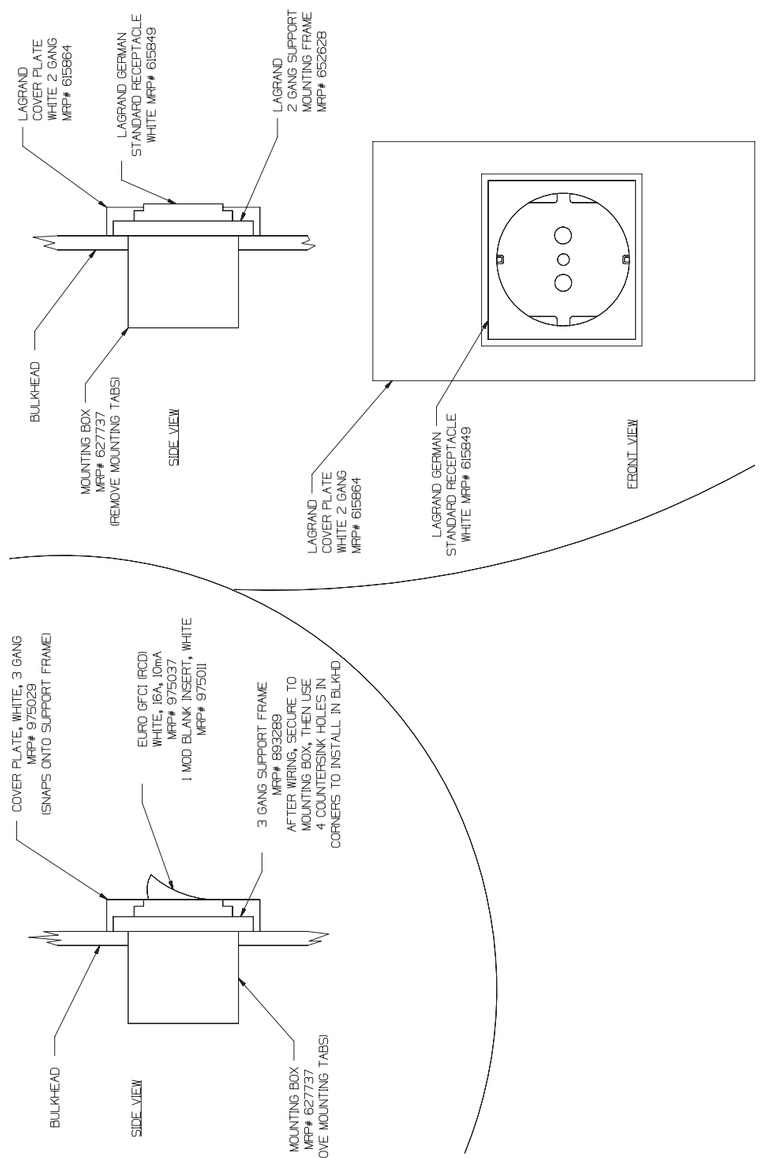


STOVE TOP SWITCH WIRING DIAGRAM
(FIG. 6.50.2) DRAWING NO. 09-634

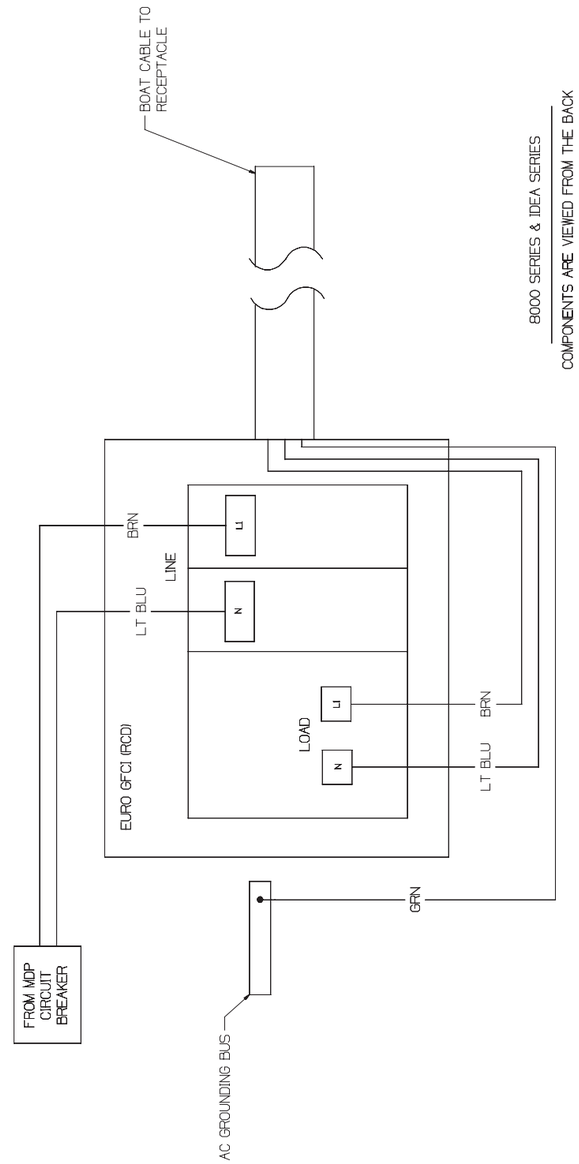


340 DA Electrical Schematics (Continued)

European GFCI (RCD) Components & Wiring
(Fig. 6.51.1) drawing no. 09-637 (1 of 2) Revision 1

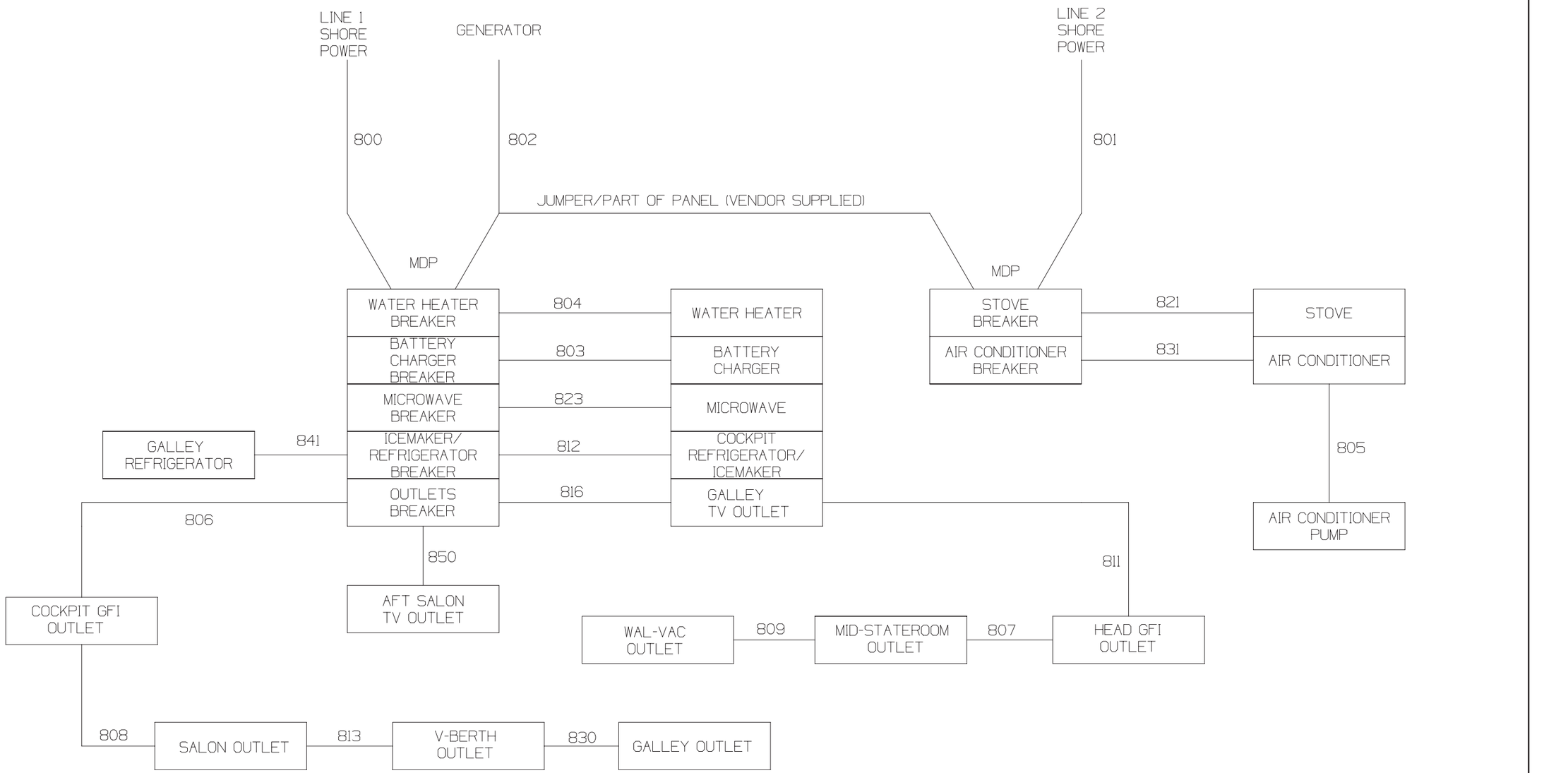


European GFCI (RCD) Components & Wiring
(Fig. 6.51.2) drawing no. 09-637 (2 of 2)



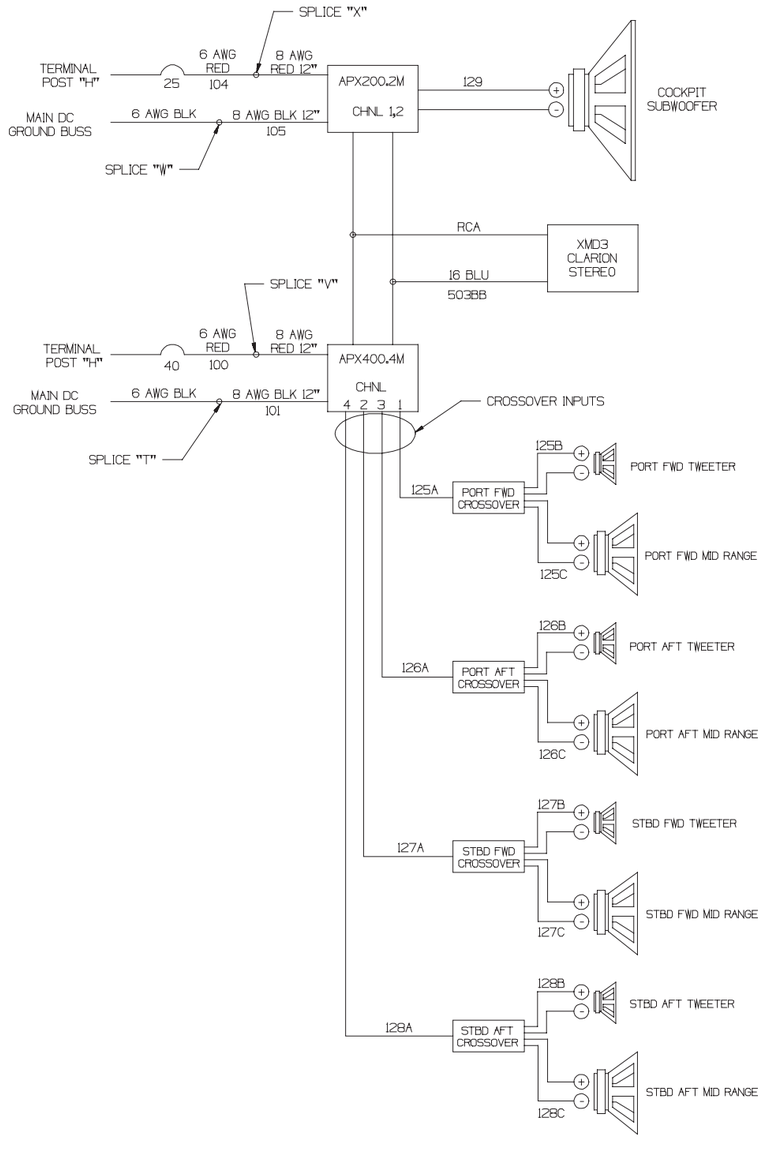
340 DA Electrical Schematics (Continued)

AC Systems Wiring Diagram
(Fig. 6.52.1) DRAWING NO. 09-640 Revision 2

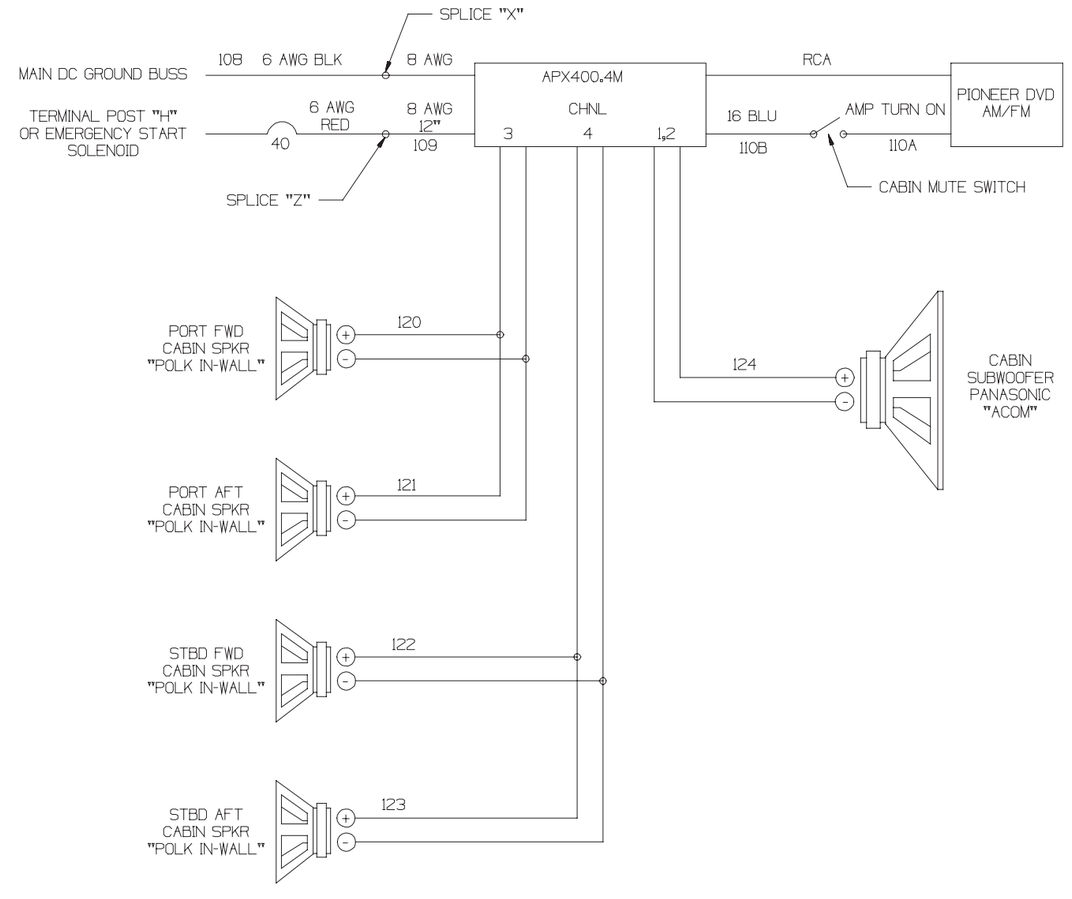


340 DA Electrical Schematics (Continued)

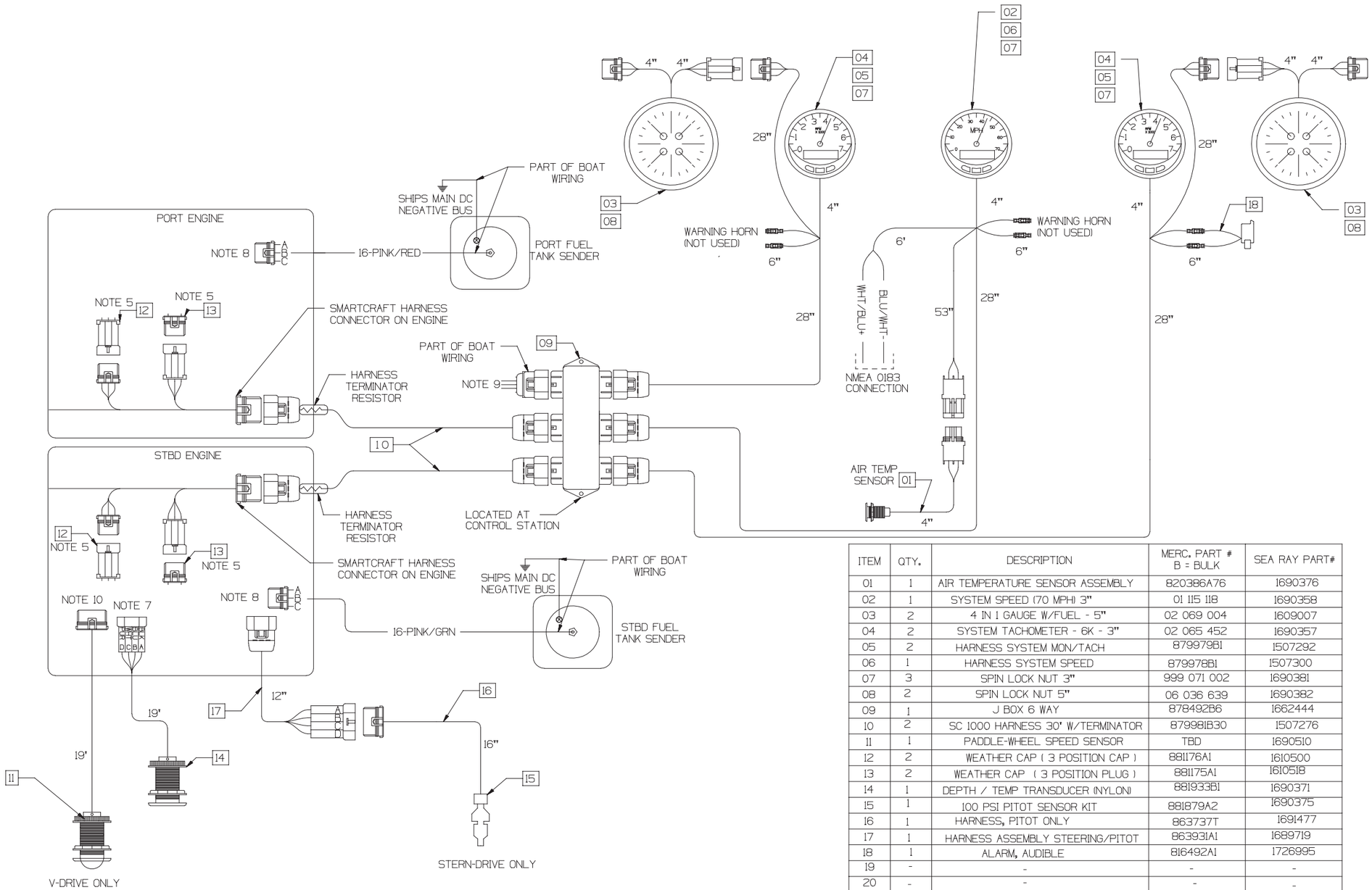
Premium Cockpit Upgrade System Wiring Digram
(Fig. 6.53.1) drawing no. 09-642



Premium Cabin Upgrade System Wiring Digram
(Fig. 6.53.2) drawing no. 09-644

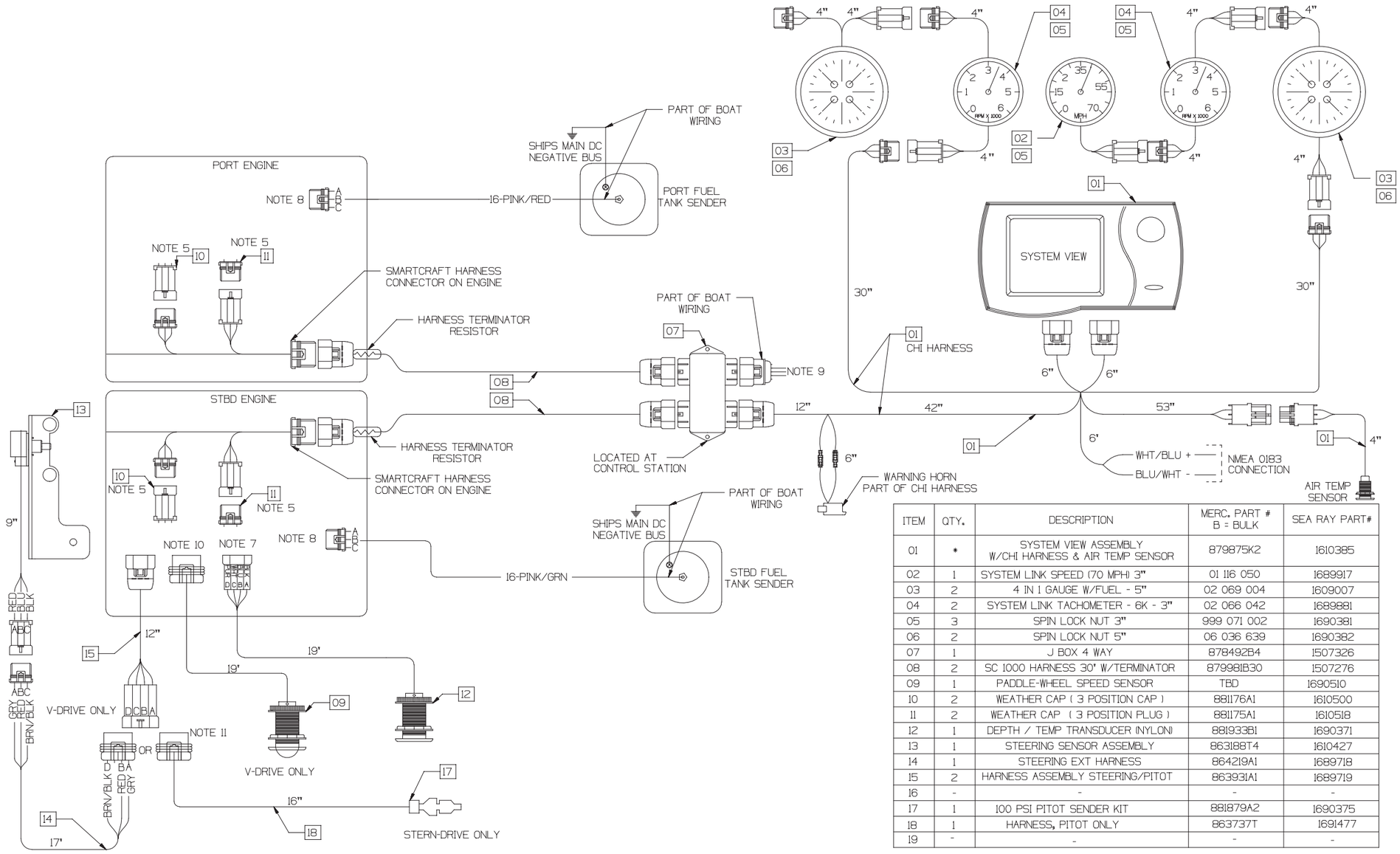


SMART CRAFT SYSTEMS DIAGRAM (SYSTEMS SPEED/TACH)
(FIG. 6.54.1) DRAWING NO. 09-701



ITEM	QTY.	DESCRIPTION	MERC. PART # B = BULK	SEA RAY PART#
01	1	AIR TEMPERATURE SENSOR ASSEMBLY	820386A76	1690376
02	1	SYSTEM SPEED (70 MPH) 3"	01 115 118	1690358
03	2	4 IN 1 GAUGE W/FUEL - 5"	02 069 004	1609007
04	2	SYSTEM TACHOMETER - 6K - 3"	02 065 452	1690357
05	2	HARNESS SYSTEM MON/TACH	879979B1	1507292
06	1	HARNESS SYSTEM SPEED	879978B1	1507300
07	3	SPIN LOCK NUT 3"	999 071 002	1690381
08	2	SPIN LOCK NUT 5"	06 036 639	1690382
09	1	J BOX 6 WAY	878492B6	1662444
10	2	SC 1000 HARNESS 30' W/TERMINATOR	879981B30	1507276
11	1	PADDLE-WHEEL SPEED SENSOR	TBD	1690510
12	2	WEATHER CAP (3 POSITION CAP)	881176A1	1610500
13	2	WEATHER CAP (3 POSITION PLUG)	881175A1	1610518
14	1	DEPTH / TEMP TRANSDUCER (NYLON)	881933B1	1690371
15	1	100 PSI PITOT SENSOR KIT	881879A2	1690375
16	1	HARNESS, PITOT ONLY	863737T	1691477
17	1	HARNESS ASSEMBLY STEERING/PITOT	863931A1	1689719
18	1	ALARM, AUDIBLE	816492A1	1726995
19	-	-	-	-
20	-	-	-	-
21	-	-	-	-

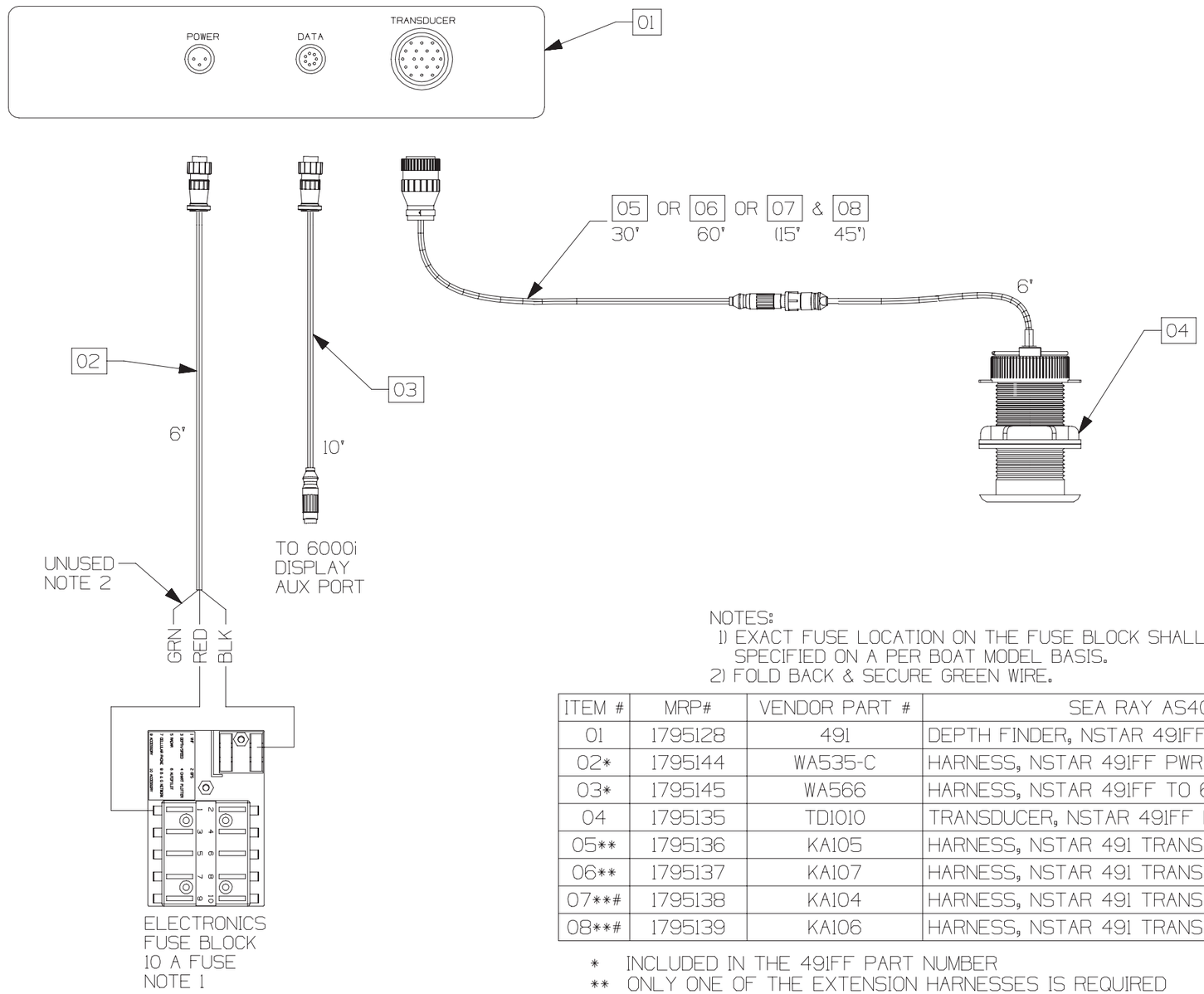
SMARTCRAFT SYSTEMS DIAGRAM (SYSTEM'S VIEW)
(FIG. 6.55.1) DRAWING NO. 09-710



ITEM	QTY.	DESCRIPTION	MERC. PART # B = BULK	SEA RAY PART#
01	*	SYSTEM VIEW ASSEMBLY W/CHI HARNESS & AIR TEMP SENSOR	879875K2	1610385
02	1	SYSTEM LINK SPEED (70 MPH) 3"	01 116 050	1689917
03	2	4 IN 1 GAUGE W/FUEL - 5"	02 069 004	1609007
04	2	SYSTEM LINK TACHOMETER - 6K - 3"	02 066 042	1689881
05	3	SPIN LOCK NUT 3"	999 071 002	1690381
06	2	SPIN LOCK NUT 5"	06 036 639	1690382
07	1	J BOX 4 WAY	878492B4	1507326
08	2	SC 1000 HARNESS 30" W/TERMINATOR	879981B30	1507276
09	1	PADDLE-WHEEL SPEED SENSOR	TBD	1690510
10	2	WEATHER CAP (3 POSITION CAP)	881176A1	1610500
11	2	WEATHER CAP (3 POSITION PLUG)	881175A1	1610518
12	1	DEPTH / TEMP TRANSDUCER (NYLON)	881933B1	1690371
13	1	STEERING SENSOR ASSEMBLY	863188T4	1610427
14	1	STEERING EXT HARNESS	864219A1	1689718
15	2	HARNESS ASSEMBLY STEERING/PITOT	863931A1	1689719
16	-	-	-	-
17	1	100 PSI PITOT SENDER KIT	881879A2	1690375
18	1	HARNESS, PITOT ONLY	863737T	1691477
19	-	-	-	-

21. 340 DA Wire Harnesses

NORTHSTAR 6000I 491 FISHFINDER
(FIG. 6.56.1) DRAWING NO. 09-743



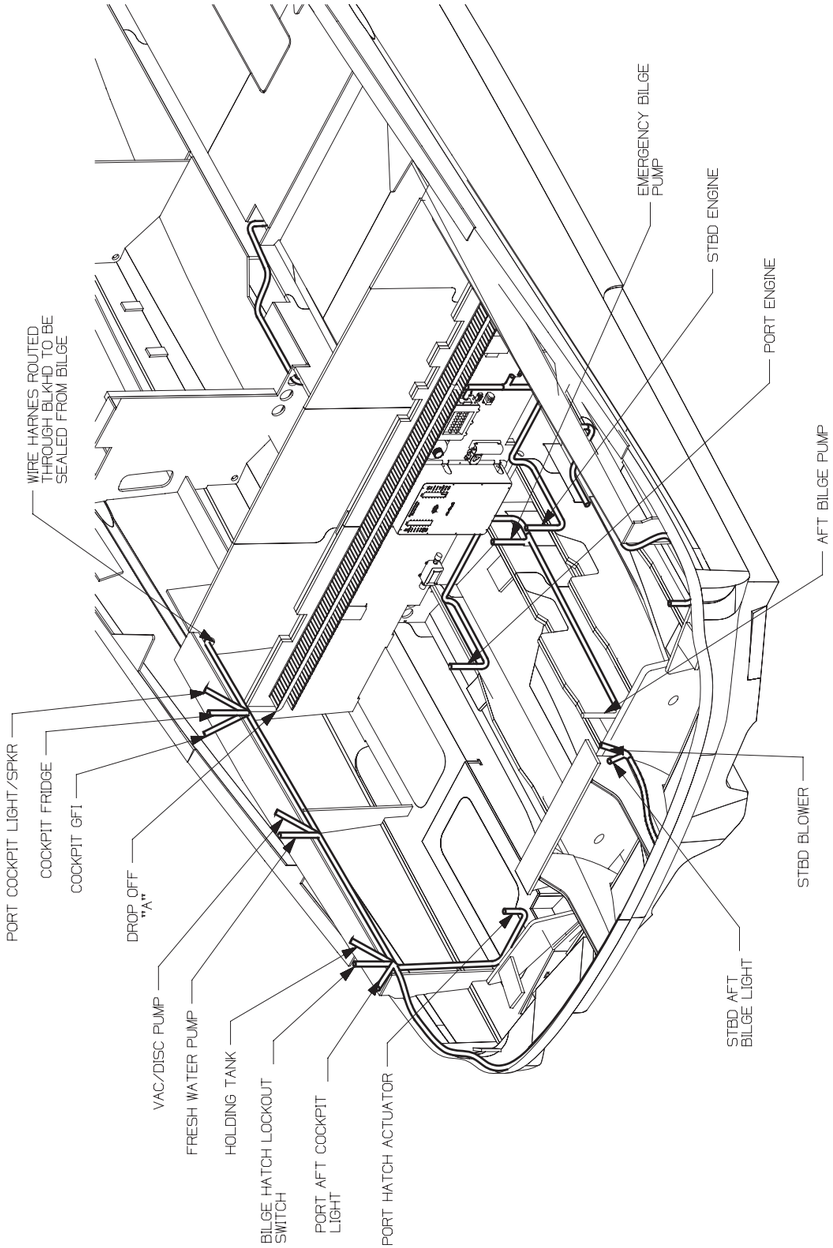
NOTES:
1) EXACT FUSE LOCATION ON THE FUSE BLOCK SHALL BE SPECIFIED ON A PER BOAT MODEL BASIS.
2) FOLD BACK & SECURE GREEN WIRE.

ITEM #	MRP#	VENDOR PART #	SEA RAY AS400 DESCRIPTION
01	1795128	491	DEPTH FINDER, NSTAR 491FF MODULE
02*	1795144	WA535-C	HARNESS, NSTAR 491FF PWR CBL 6 FT
03*	1795145	WA566	HARNESS, NSTAR 491FF TO 6000i CBL 10FT
04	1795135	TD1010	TRANSDUCER, NSTAR 491FF DEP/TEM W/6FT PIGTAIL
05**	1795136	KA105	HARNESS, NSTAR 491 TRANS DPTH/TMP 30°
06**	1795137	KA107	HARNESS, NSTAR 491 TRANS DPTH/TMP 60°
07**#	1795138	KA104	HARNESS, NSTAR 491 TRANS DPTH/TMP 15°
08**#	1795139	KA106	HARNESS, NSTAR 491 TRANS DPTH/TMP 45°

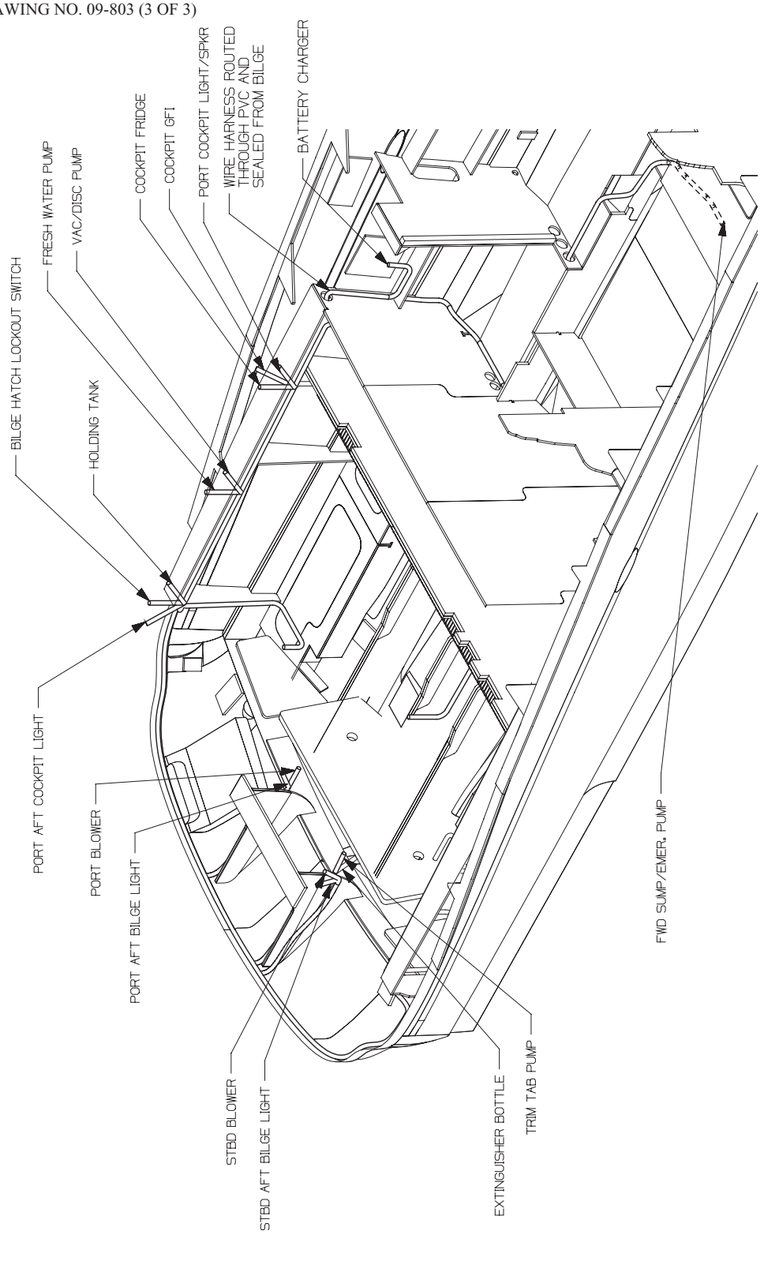
* INCLUDED IN THE 491FF PART NUMBER
** ONLY ONE OF THE EXTENSION HARNESSES IS REQUIRED
# MUST ORDER BOTH MRP#S TO ACHIEVE 60FT EXTENSION HARNESS WITH BRIDGE BREAKDOWN

340 DA Wire Harnesses (Continued)

BILGE HARNESS INSTALLATION (V-DRIVE)
(FIG. 6.57.1) DRAWING NO. 09-803 (1 OF 3)

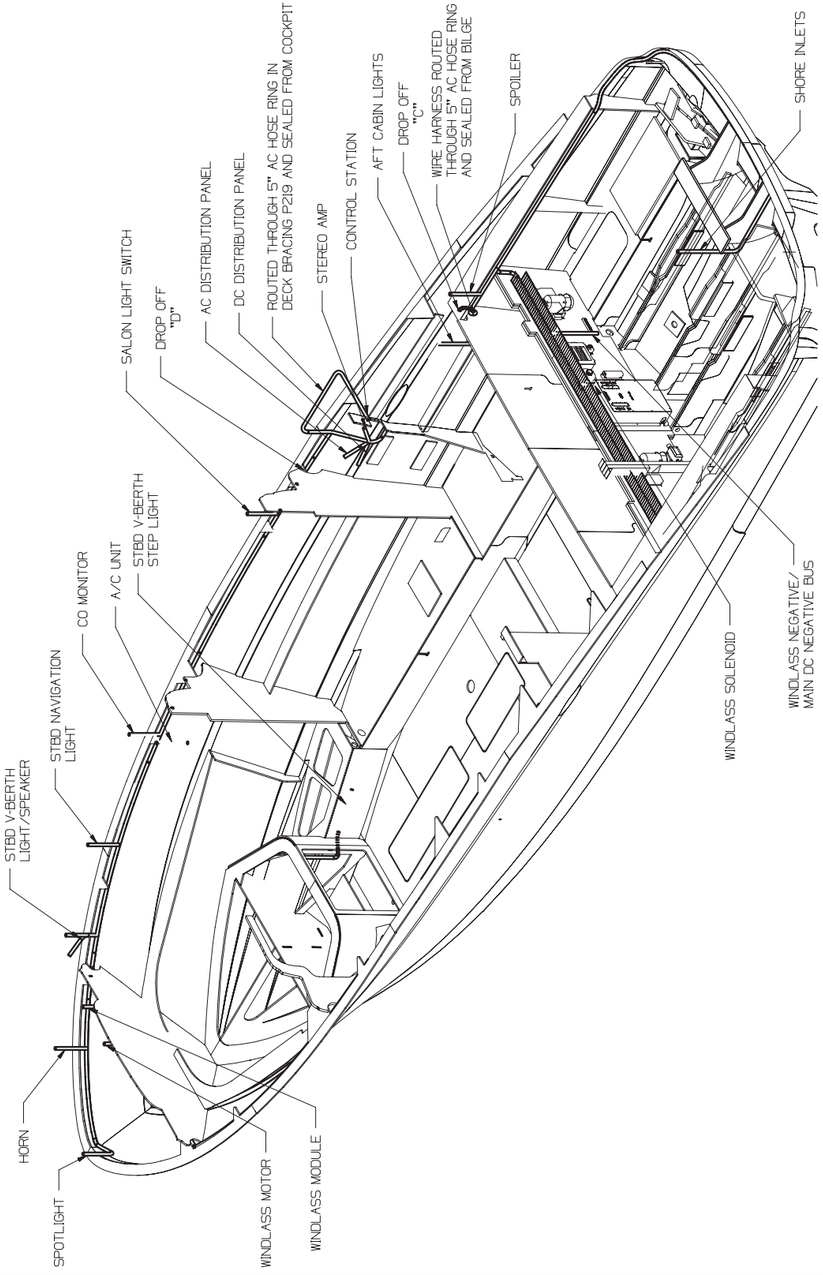


BILGE HARNESS INSTALLATION (V-DRIVE)
(FIG. 6.57.2) DRAWING NO. 09-803 (3 OF 3)

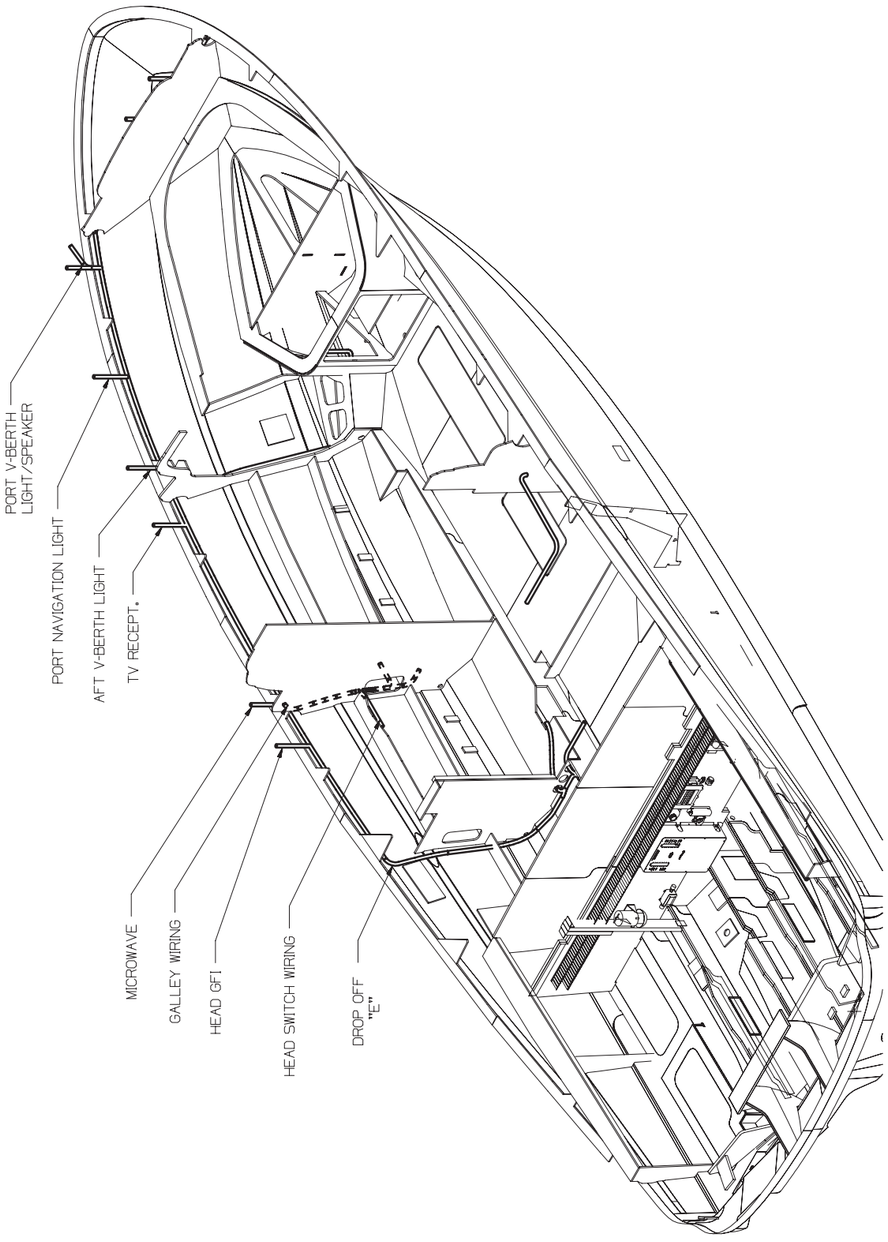


340 DA Wire Harnesses (Continued)

CABIN DC HARNESS INSTALLATION
(FIG. 6.58.1) DRAWING NO. 09-806 (1 OF 3)

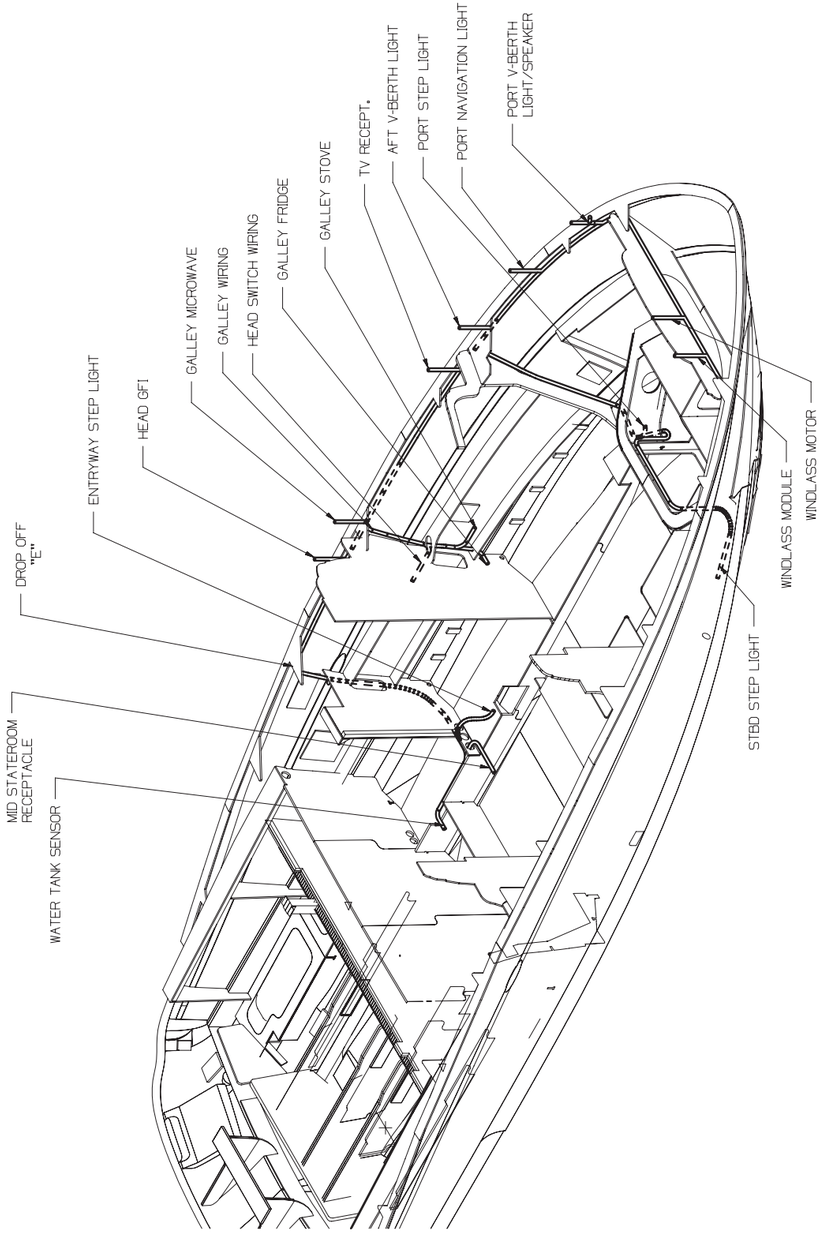


CABIN DC HARNESS INSTALLATION
(FIG. 6.58.2) DRAWING NO. 09-806 (2 OF 3)



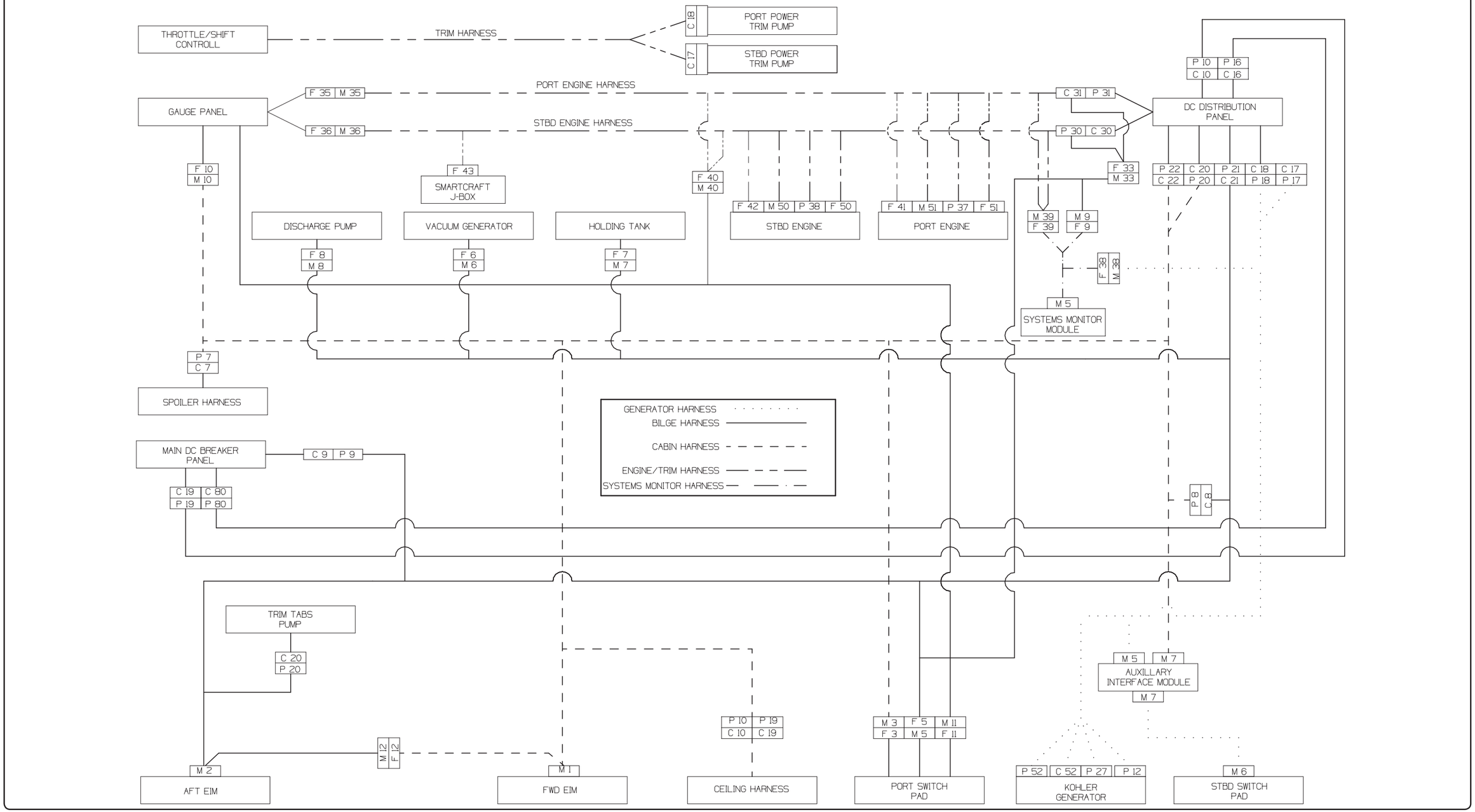
340 DA Wire Harnesses (Continued)

CABIN DC HARNESS CONSTRUCTION
(FIG. 6.59.1) DRAWING NO. 09-806 (3 OF 3)



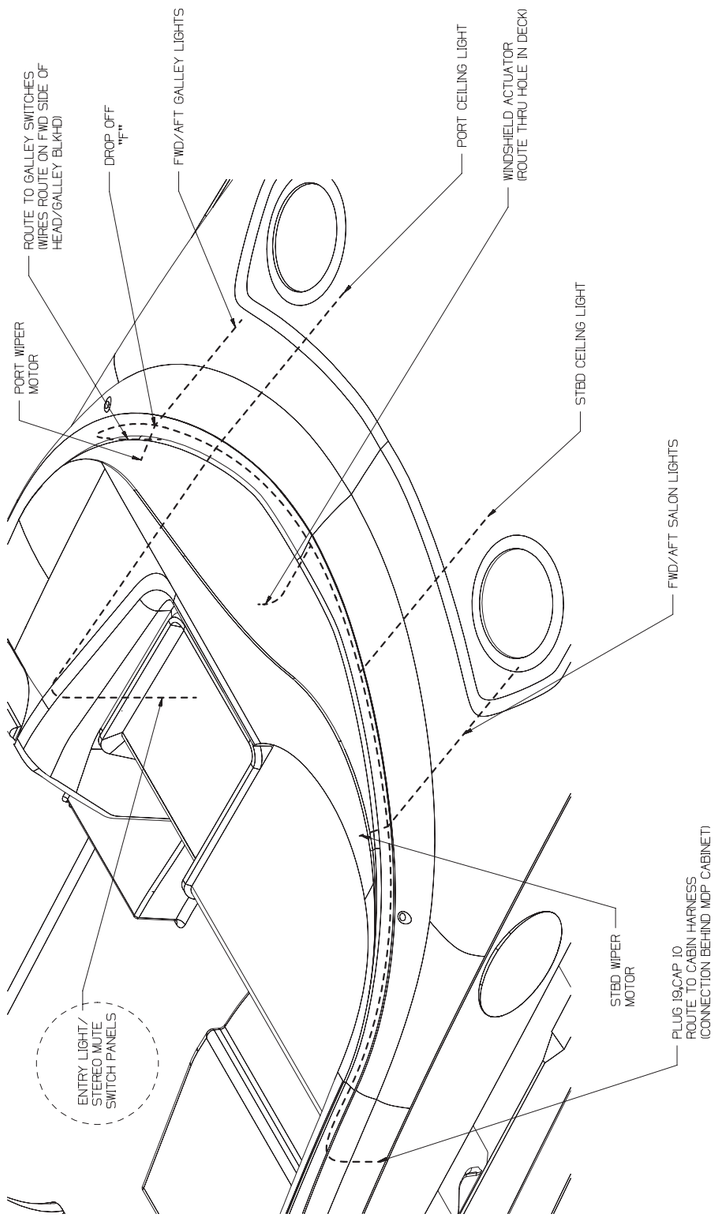
340 DA Wire Harnesses (Continued)

INTERCONNECTION DIAGRAM
(FIG. 6.60.1) DRAWING NO. 09-869

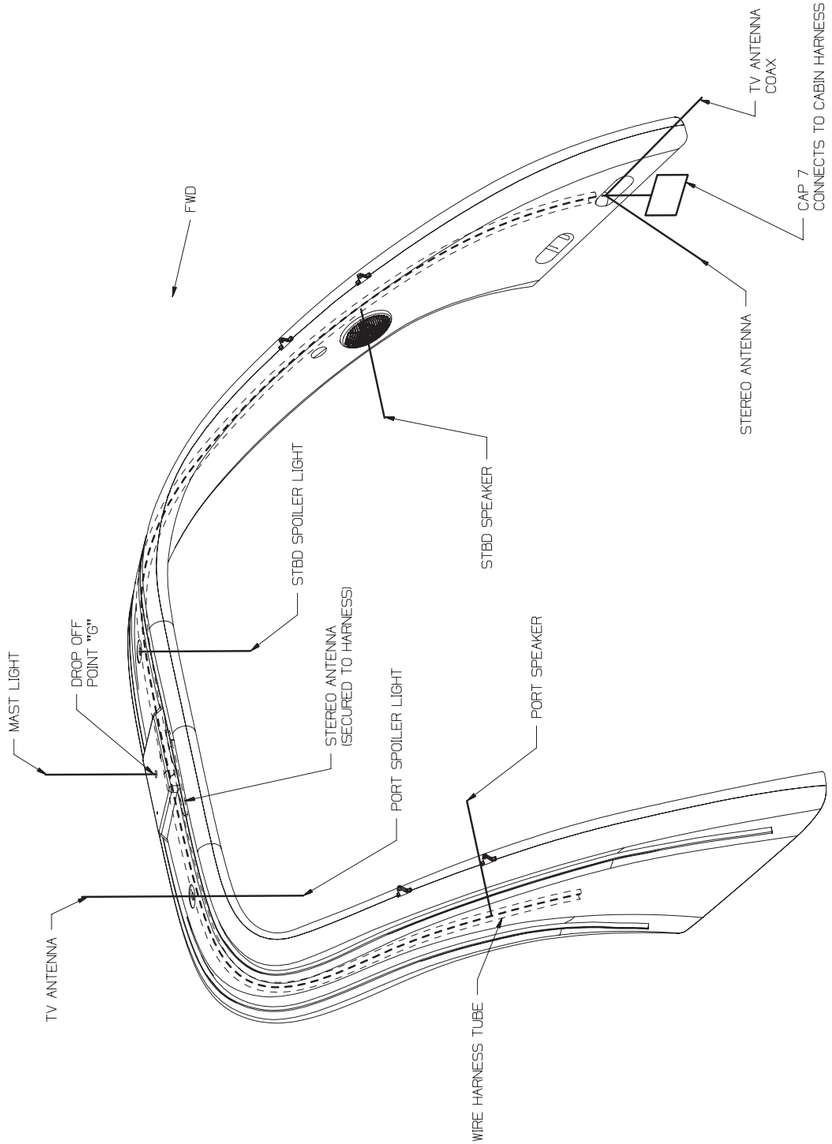


340 DA Wire Harnesses (Continued)

Ceiling Harness Installation
(Fig. 6.61.1) drawing no. 09-875


ROUTE TO GALLEY SWITCHES (WIRES ROUTE ON FWD SIDE OF HEAD/GALLEY BLKHD)
DROP OFF "F"
FWD/AFT GALLEY LIGHTS
PORT CEILING LIGHT
WINDSHIELD ACTUATOR (ROUTE THRU HOLE IN DECK)
PORT WIPER MOTOR
STBD CEILING LIGHT
FWD/AFT SALON LIGHTS
ENTRY LIGHT/ STEREO MUTE SWITCH PANELS
STBD WIPER MOTOR
PLUG 19CAP 10 ROUTE TO CABIN HARNESS (CONNECTION BEHIND MDP CABINET)

Spoiler Harness Installation
(Fig. 6.62.2) drawing no. 09-877



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1. Layout and Accessory Locations

Pages 2.5 through 2.10 show the location and arrangement of the most important equipment and components on your boat. Using these drawings, walk through your boat, locate the features shown, and become familiar with their operation and maintenance.

2. Carbon Monoxide Monitor

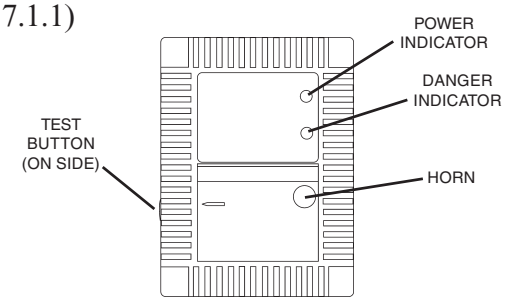
The 340 DA is equipped with a carbon monoxide (CO) monitor on the V-berth starboard hanging locker. The CO monitor is an electronic instrument that detects carbon monoxide. When there is a build-up of CO in any room, the monitor in that room will alert the occupants by a flashing a DANGER light and sounding an alarm. The CO monitors are powered through a breaker on the DC Distribution panel at the control station.

It is important that you read and understand the CO monitor information and operating instructions. It is extremely important that you become familiar with the CO monitor and its functions.

A. Testing the CO Monitor

Test the monitor on your boat at manufacturers required intervals by pushing the TEST button on the side of the unit. If the unit is operating correctly both audible and visual warning indicators will be activated.

Carbon Monoxide Monitor
(Fig. 7.1.1)



⚠ CAUTION

This detector will only indicate the presence of carbon monoxide gas at the sensor. Carbon monoxide may be present in other areas.

⚠ DANGER

Actuation of the CO monitor indicates the presence of carbon monoxide which can be FATAL.

EVACUATE THE PREMISES IMMEDIATELY. DO A HEAD COUNT TO CHECK THAT ALL PERSONS ARE ACCOUNTED FOR. CALL THE NEAREST FIRE DEPARTMENT AND ASK THEM TO DETERMINE THE SOURCE OF CARBON MONOXIDE. DO NOT REENTER PREMISES UNTIL IT HAS BEEN AIRED OUT AND THE PROBLEM IS CORRECTED.

⚠ CAUTION

To reduce the risk of carbon monoxide poisoning, test the monitor operation when not in use for 10 days or more.

3. Air Conditioning & Heating

The air conditioning/heating system installed in your Sea Ray® is of the size and capacity best suited for the size of your boat.

The system is fitted with a return air filter that should be cleaned once a month. To remove the air filter for cleaning, slide filter out of the compressor/blower unit (see Fig. 7.2.2).

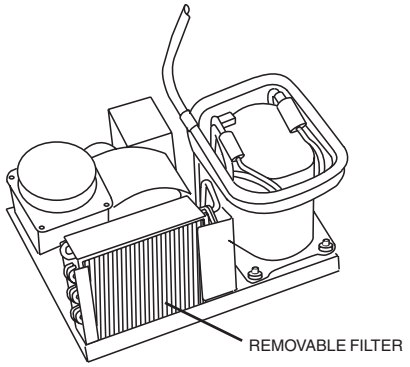
The system is cooled to maintain optimal operating temperature by a raw water pump. The pump draws water through a seacock in the bilge and filters it through a sea water strainer. (The sea water strainer should be inspected and cleaned frequently. To clean strainer, refer to Section 2 – *Seacocks & Strainers.*) The water passes through the air conditioning/heating unit, then flows overboard.

A. TO START SYSTEM:

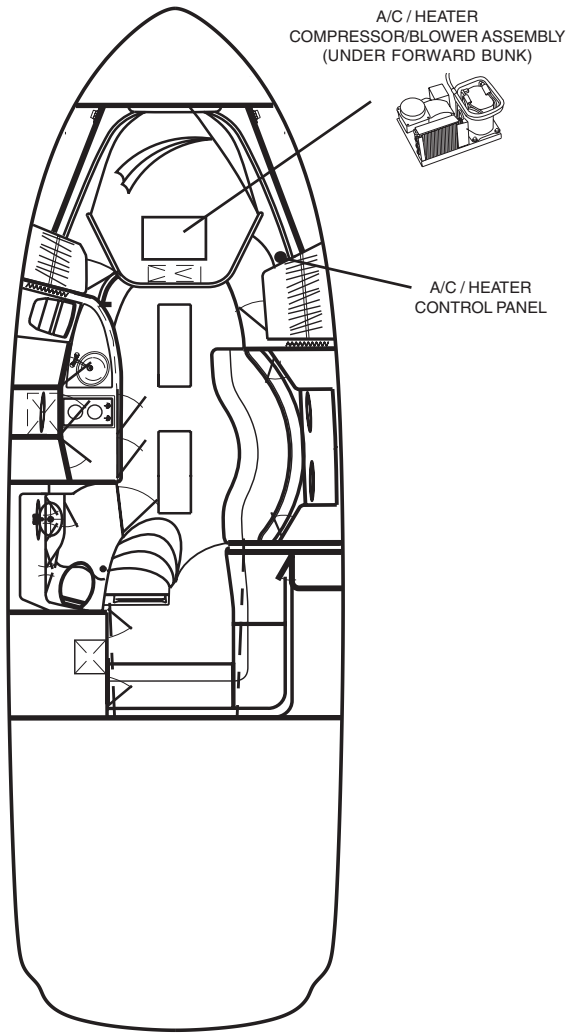
1. Make sure the seacock for the cooling pump is open.
2. Turn ON the AIR CONDITIONER circuit breaker on the AC main distribution panel.
3. Follow the instructions in the Air Conditioner/ Heater manual for control pad operation.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

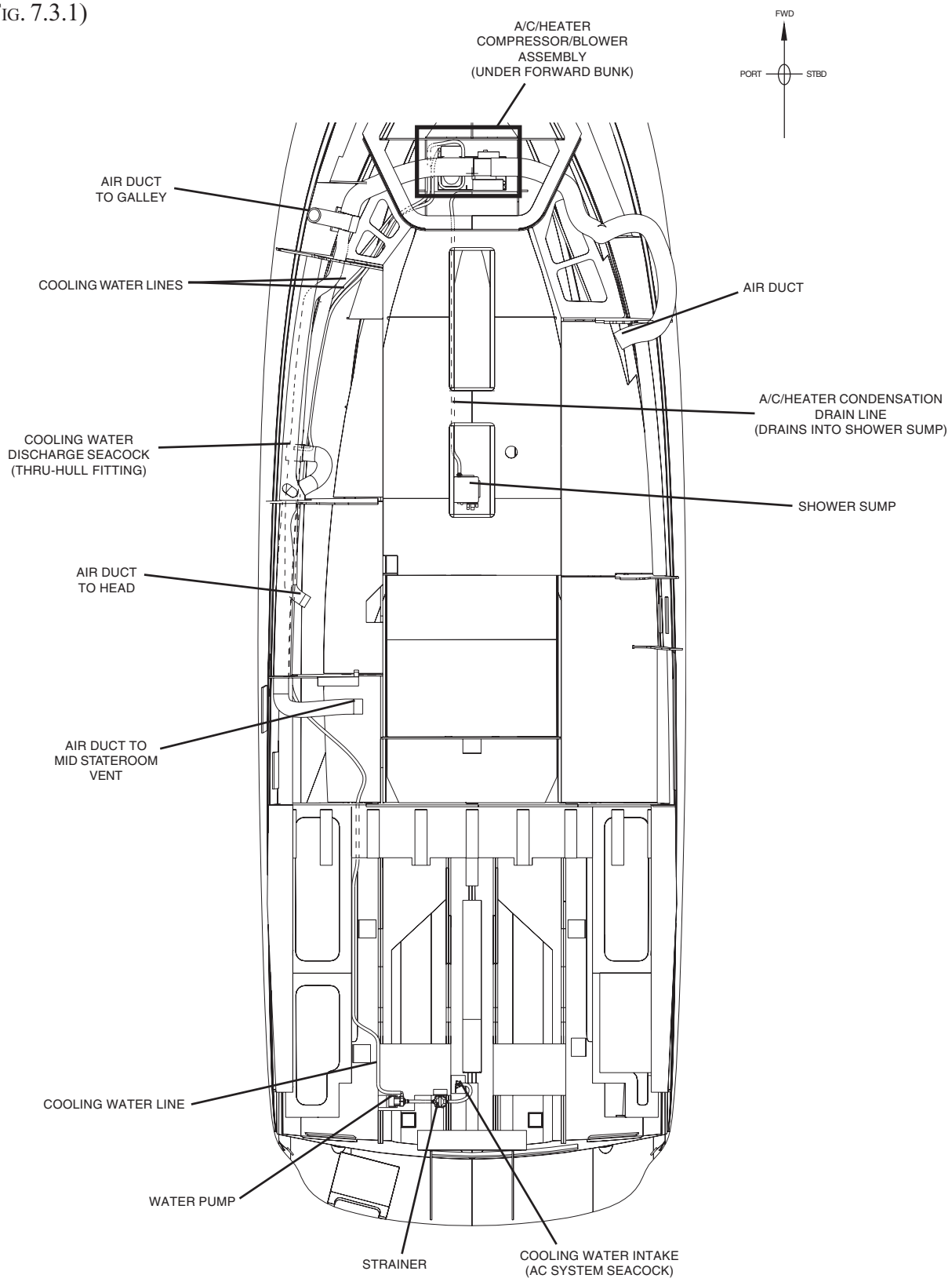
TYPICAL AIR CONDITIONING COMPRESSOR/ BLOWER (FIG. 7.2.1)



AIR CONDITIONING & HEATING SYSTEM (FIG. 7.2.2)



AIR CONDITIONING COMPONENT ARRANGEMENT
(FIG. 7.3.1)



4. WATER SYSTEM

The fresh water system consists of a 45 gallon (170 liter) water tank, 12 volt water pump, water system filter, water heater, distribution manifold and level indicator.

The fresh water system is activated by the FRESH WATER PUMP breaker on the cabin DC distribution panel (Figure 6.9.1).

To begin initial operation:

1. Fill the water tank from a source known to provide safe, pure drinking water by removing the cap marked WATER located on the port deck walkway and inserting the water hose nozzle in the opening. Do not mistake the fuel fill or the waste plate for the water tank fill cap.
2. Turn ON the FRESH WATER PUMP breaker.
3. Open the sink faucet to allow any air trapped in the water line to dissapate.
4. Shut off faucet as flow becomes free of air. Shutting off the faucet will cause the pump to shut off. As long as the water pump and battery switches are on, the pump will automatically provide water on demand.

A. SANITIZING THE WATER SYSTEM

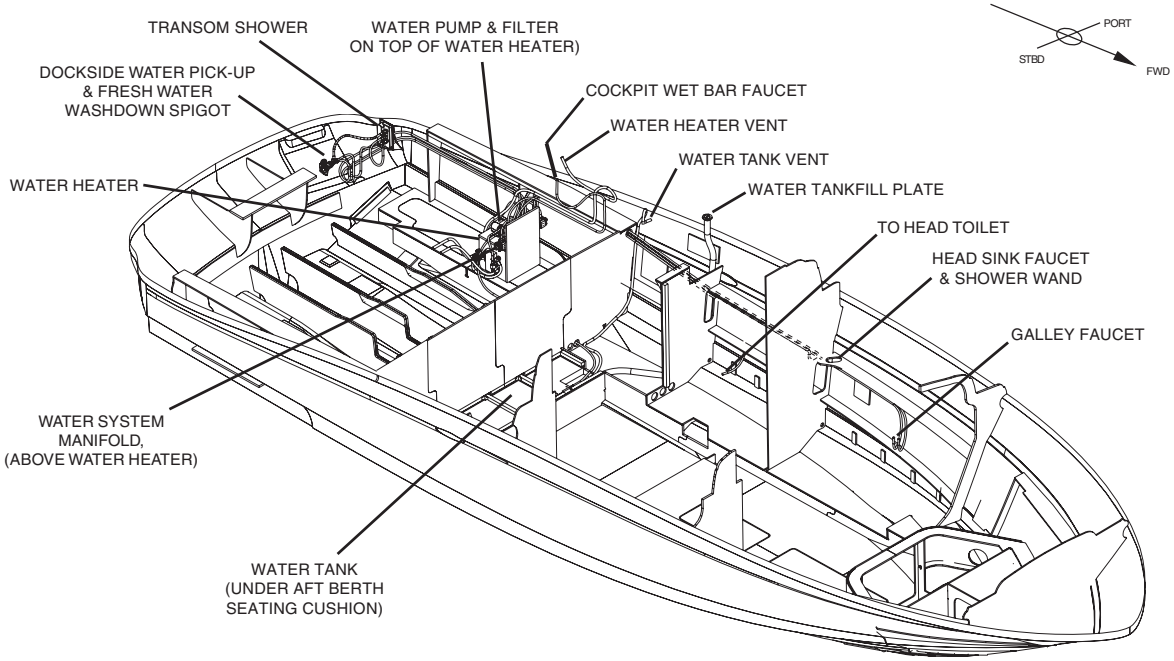
If the fresh water system has not been used for some time, or if you suspect that it has been contaminated, then it should be sanitized. Your marine dealer may have a water treatment additive that can be used to sanitize the system. Follow the instructions provided with the additive.

If a water treatment additive is not available, the following steps may be followed to sanitize the water system:

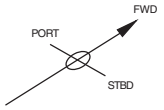
1. Pump the water tank empty. Shut OFF water system breaker.
2. Determine the capacity of your water tank (your standard water tank holds 45 gallons (170 liters)). You will need approximately one (1) gallon of weak bleach solution for each fifteen (15) gallons of tank capacity.
3. Prepare the proper amount of a weak bleach solution by mixing 1/4 cup of unscented household chlorine bleach per gallon of water.
4. Pour weak bleach solution into the water tank. Remember, use about one (1) gallon of weak bleach solution for each fifteen (15) gallons of tank capacity.
5. Fill the remainder of the tank with fresh, clean water. This will further dilute the weak bleach solution.
6. Switch ON the water system breaker, then turn on the faucets and allow the air to be exhausted from the plumbing system. By doing this, the entire fresh water system will be filled with a sanitizing solution.
7. Allow the sanitizing solution to stand in the water system for three (3) hours.
8. Pump the water tank empty.
9. Fill the water system completely with fresh, clean water. Turn on the faucet and permit the entire contents of fresh, clean water to run through the system. This will flush the sanitizing solution out of the plumbing.
10. Fill the water system again, with fresh, clean water, and turn on the faucet to permit the air to dissapate.

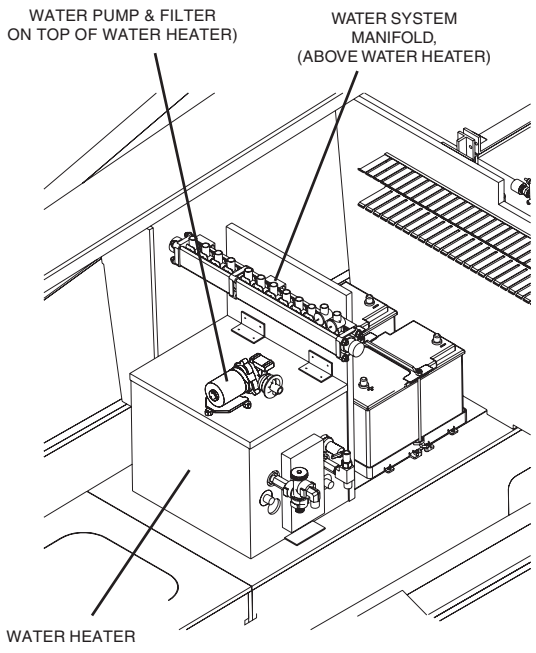
Your water system is now sanitized.

WATER SYSTEM INSTALLATION (FIG.7.5.1)

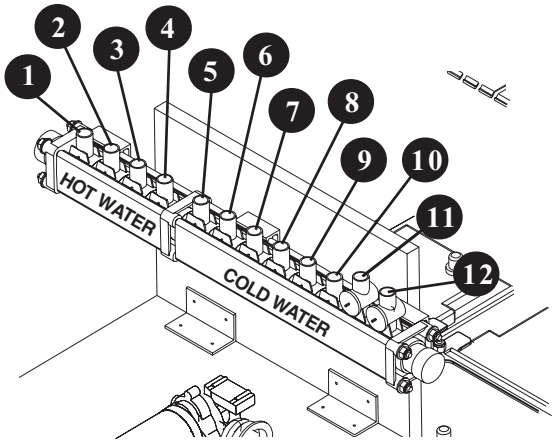


WATER SYSTEM INSTALLATION (PORT SIDE OF ENGINE ROOM) (FIG.7.5.2)





WATER SYSTEM MANIFOLD (FIG.7.5.3)



HOT WATER
1. TO TRANSOM SHOWER
2. TO GALLEY SINK
3. TO HEAD SINK
4. FROM WATER HEATER

COLD WATER
5. TO TRANSOM SHOWER
6. TO GALLEY SINK
7. TO HEAD SINK
8. TO HEAD TOILET
9. TO DOCKSIDE WATER INLET
10. TO COCKPIT WET BAR
11. TO WATER HEATER
12. FROM WATER PUMP

B. WINTERIZING THE WATER SYSTEM

For winterizing the water system refer to *Section 8, Winterization Checklist For Boats Stored on Land, E. Water System.*

C. WATER DISTRIBUTION MANIFOLD

The water distribution manifold, located in the engine room, directs fresh water to the various equipment throughout the boat.

In the event of a water leak at one of the system components, ie. sink faucet, shower valve or spigot, the valve for that component can be closed. The rest of the system is left operational.

Example:

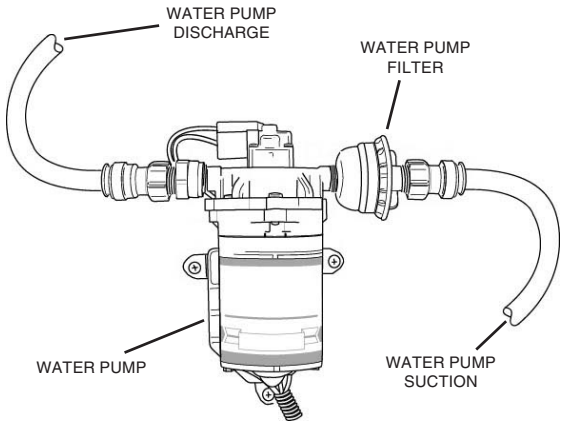
1. If the head sink cold water line develops a leak.
2. Close the Cold Head Sink valve on the manifold.
3. The rest of the water system remains operational while repairs are made to the head sink cold water line.
4. After repairs are made, turn on the Cold Head Sink valve.

D. WATER PUMP AND FILTER

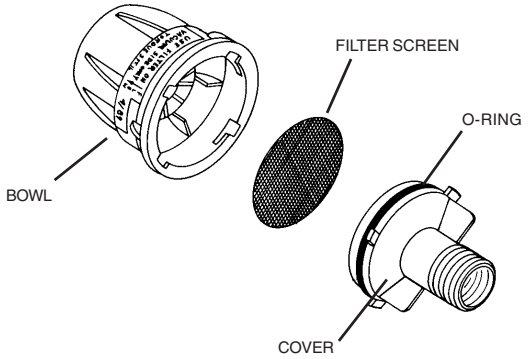
The water pump and filter are located on the port side of the engine room above the water heater. The filter prevents particles from entering the pump head. The filter should be checked and cleaned once a season or when flow is restricted.

Before servicing the system, turn the FRESH WATER PUMP breaker OFF and open a faucet to release pressure on the system. To clean the filter, remove the screen and rinse with clean water. Replace, making sure the O-ring is in place when replacing the cover.

WATER PUMP AND FILTER
(FIG.7.6.1)



WATER PUMP FILTER
(FIG.7.6.2)



E. WATER HEATER

The water heater is located in the port side of the engine room. It operates on the 120 volt (or 220 volt) dockside system or generator and has a circuit breaker on the AC main distribution panel located in the salon.

⚠ WARNING

Make certain the hot water lines are air free, indicating the water heater is full. Damage will occur to water heater if it is not full when turned on.

The water heater has a check valve to prevent hot water from back-washing into the cold water source and a pressure relief valve to avoid damage to the heater from over pressure of excessive temperature.

The hot water exchanger is designed to heat water without having to turn the hot water heater on. It works by pumping water from the engine cooling system, out the intake manifold to the hot water heater. It is then circulated through a coil inside the water heater where it heats the potable water. The water from the engine then exits the water heater and returns to the engine through the engine water pump.

INITIAL START-UP OR AFTER WINTERIZATION

1. Make sure the WATER HEATER breaker is OFF.
2. Make sure drain and pressure relief valve is closed.
3. Fill the heater with water by turning ON the WATER PUMP breaker.
4. Open the hot water faucets until all air is eliminated from the system.
5. Make certain the heater is full of water. **COMPLETE FAILURE OF THE HEATING ELEMENTS WILL RESULT IF THEY ARE NOT COMPLETELY IMMERSED IN WATER AT ALL TIMES.**
6. Turn the WATER HEATER breaker ON.

The water heater is equipped with an adjustable combination temperature regulating control and manual reset high limit device located behind the lower access cover. ALWAYS DISCONNECT POWER TO THE UNIT BEFORE REMOVING THE ACCESS COVER. Refer to the water heater information in the Owner's Manual Packet for instructions on adjusting the thermostat.

To maintain water heater properly, drain whenever the possibility of freezing occurs and frequently inspect lines and connections for leaks.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

F. SHOWER SYSTEM

The shower drains into a self-contained shower sump containing a pump and float switch.

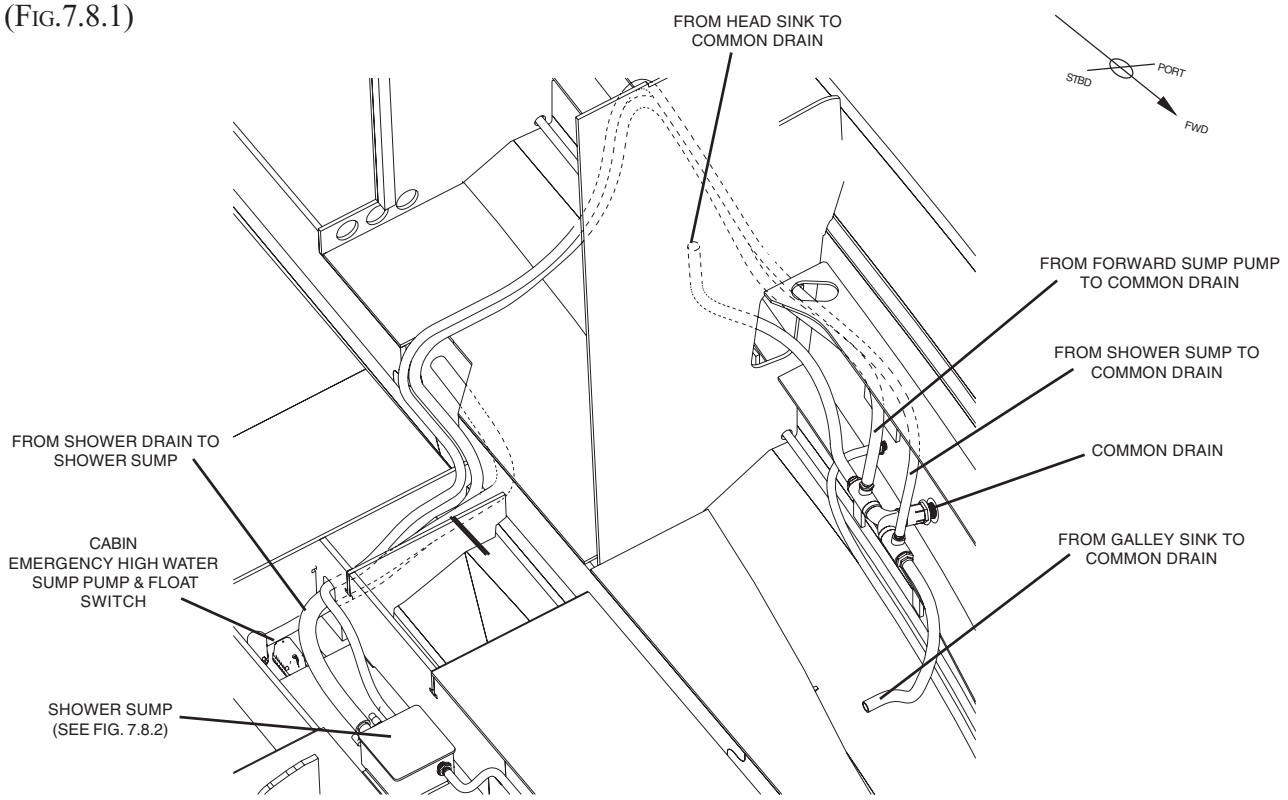
NOTE: Air conditioner condensation also drains into the shower sump.

The sump pump is fully automatic and is protected by a breaker on the main DC breaker panel. Check the pump and float switch for obstructions and proper working order.

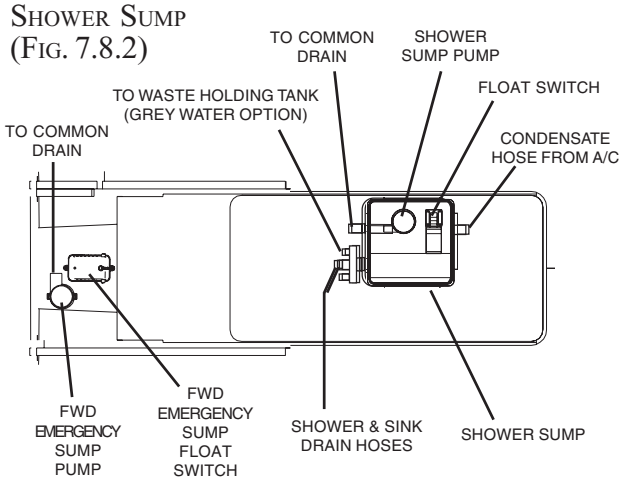
The pump comes on when there is enough water in the sump to raise the float switch and start the pump. If it does not come on after one or two gallons of water drain from the shower, turn the water off and check the pump and float switch for proper operation.

After using the shower, it is recommended that you run a gallon of clean water through the shower drain to clean out soap residue. Check the pump and float switch for obstructions and proper working order.

DRAIN LINE ROUTING
(FIG.7.8.1)


FROM HEAD SINK TO COMMON DRAIN
PORT
STBD
FWD
FROM FORWARD SUMP PUMP TO COMMON DRAIN
FROM SHOWER SUMP TO COMMON DRAIN
COMMON DRAIN
FROM GALLEY SINK TO COMMON DRAIN
FROM SHOWER DRAIN TO SHOWER SUMP
CABIN EMERGENCY HIGH WATER SUMP PUMP & FLOAT SWITCH
SHOWER SUMP (SEE FIG. 7.8.2)

SHOWER SUMP
(FIG. 7.8.2)



G. FRESH WATER WASHDOWN

The washdown spigot is located in the transom storage compartment. The system uses water from the fresh water tank. The FRESH WATER PUMP breaker must be ON to operate the system.

H. DOCKSIDE WATER INLET

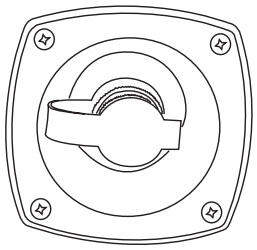
The dockside water inlet allows use of a dockside water source to provide water for the boat's fresh water system.

To Use The System:

1. Make sure the WATER SYSTEM breaker is OFF.
2. Remove the plug from the face of the dockside water inlet.
3. Connect a drinking water hose to the water outlet on the dock, then to the dockside water inlet on the boat and turn on the water at the dock.

All fresh water faucets and showers are now usable. To disconnect the system, reverse the procedure, making sure the plug is reinstalled tightly.

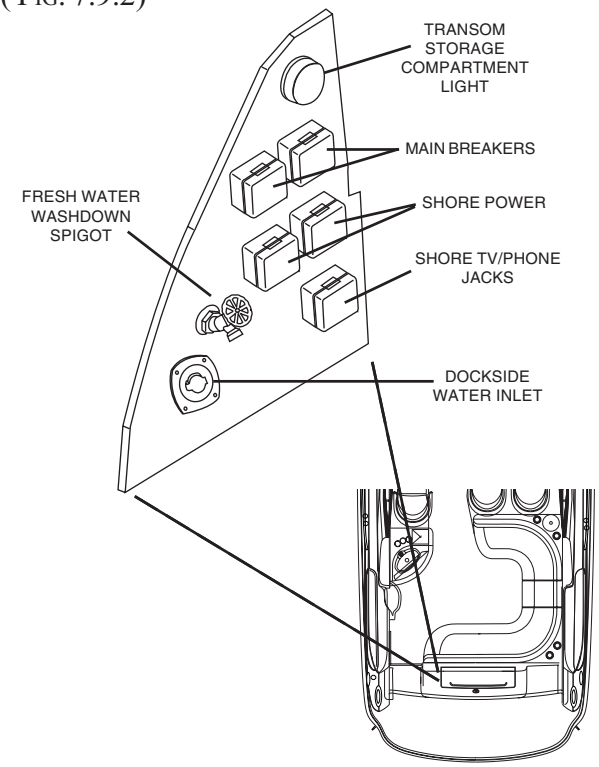
DOCKSIDE WATER INLET
(FIG. 7.9.1)



⚠ WARNING

- **DO NOT leave boat unattended with the dockside water hose connected.**
- **Dockside water should be connected during periods of heavy water usage only.**

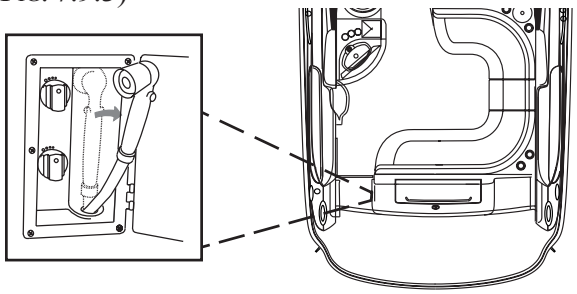
WATER SYSTEM CONNECTIONS
(INSIDE TRANSOM STORAGE COMPARTMENT)
(FIG. 7.9.2)



I. COCKPIT SHOWER

The cockpit shower has a hot and cold control and shower wand which are located in a receptacle in the transom storage compartment. Squeeze the button on the shower wand to dispense water and turn the knobs to adjust water temperature. The WATER PUMP breaker on the main distribution panel must be ON to operate the shower.

COCKPIT SHOWER
(FIG. 7.9.3)



5. GRAY WATER SYSTEM (OPTION)

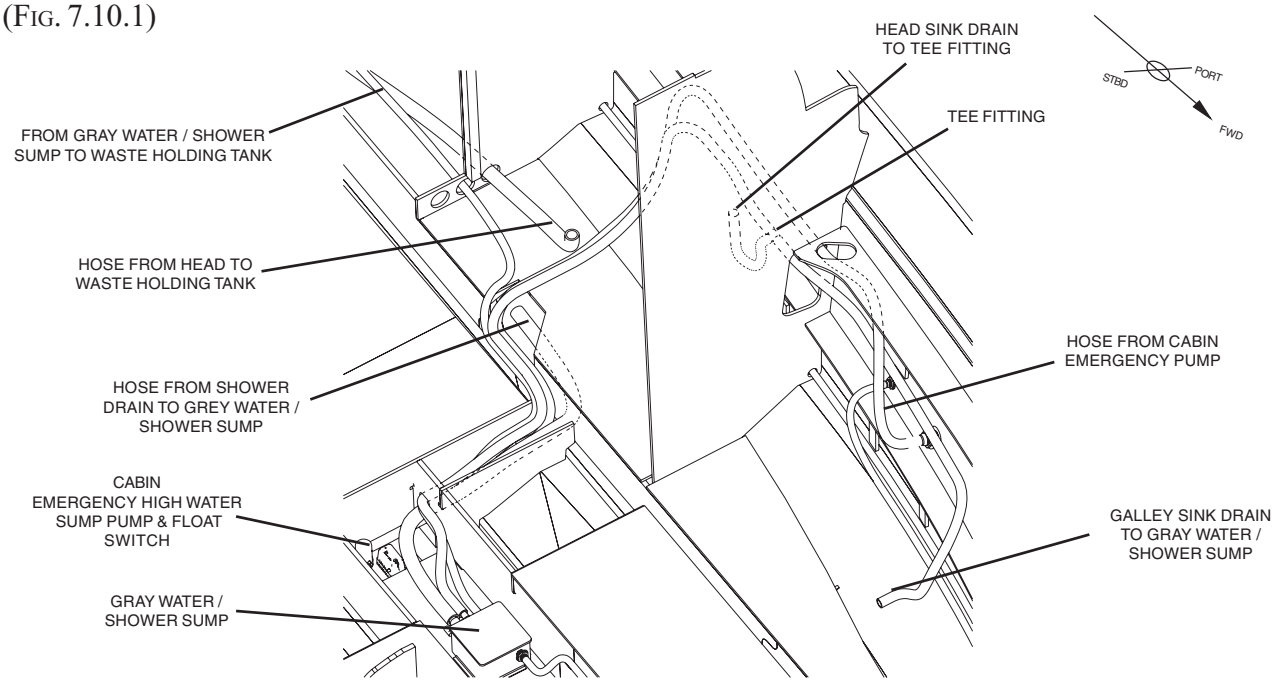
The gray water system is designed for boats that are used in areas that restrict overboard water discharge.

The system directs waste water from accessories such as the galley and head sinks and shower to the shower sump that is fitted with a float switch and pump that pumps the water to the head system holding tank. The tank must be emptied when it becomes full.

To empty the head/gray water system holding tank, the services of a dockside pump out station will be needed.

Follow instructions at the station and make sure pump out station hose is inserted into the deck plate marked GRAY WATER/WASTE.

GRAY WATER SYSTEM HOSE ROUTING
(FIG. 7.10.1)


HEAD SINK DRAIN TO TEE FITTING
STBD
PORT
FWD
TEE FITTING
FROM GRAY WATER / SHOWER SUMP TO WASTE HOLDING TANK
HOSE FROM HEAD TO WASTE HOLDING TANK
HOSE FROM CABIN EMERGENCY PUMP
HOSE FROM SHOWER DRAIN TO GREY WATER / SHOWER SUMP
CABIN EMERGENCY HIGH WATER SUMP PUMP & FLOAT SWITCH
GALLEY SINK DRAIN TO GRAY WATER / SHOWER SUMP
GRAY WATER / SHOWER SUMP

6. HEAD SYSTEM

Your Sea Ray® is available with a variety of head system options. Below is a description of each option. You should be aware of which option(s) your boat is equipped with and read the sections pertaining to it. The Owner's Manual Packet in your boat contains information pertaining to your head system that should be carefully read.

⚠ CAUTION

Do not flush facial tissue, paper towels or sanitary napkins in head. Such material can damage waste disposal system and the environment.

NOTICE

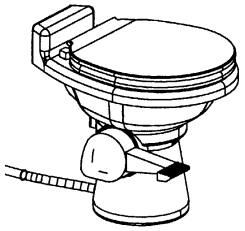
There is a possibility of being fined for having an operable direct overboard discharge in some waters. Close waste discharge seacock and remove handle or take other measures to avoid fine.

A. REQUIREMENTS FOR OPERATORS

The Environmental Protection Agency (EPA) standards state that in freshwater lakes, freshwater reservoirs or other freshwater impoundments whose inlets or outlets are such as to prevent the ingress or egress by vessel traffic subject to this regulation, or in rivers not capable of navigation by interstate vessel traffic subject to this regulation, marine sanitation devices certified by the U.S. Coast Guard installed on all vessels shall be designed and operated to prevent the overboard discharge of sewage, treated or untreated, or of any waste derived from sewage. The EPA standards further state that this shall not be construed to prohibit the carriage of Coast Guard-certified flow-through treatment devices which have been secured so as to prevent such discharges. They also state that waters where a Coast Guard certified marine sanitation device permitting discharge is allowed include coastal waters and estuaries, the Great Lakes and interconnecting waterways, freshwater lakes and impoundments accessible through locks, and other flowing waters that are navigable interstate by vessels subject to this regulation (40 CFR 140.3).

B. VACUFLUSH® HEAD

VACUFLUSH® HEAD (FIG. 7.11.1)



The VacuFlush® head utilizes a HEAD SYSTEM breaker on the main distribution panel. The foot pedal at the base of the toilet opens a mechanical seal and vacuum forces waste through the opening in the bowl to an accumulator tank, through the vacuum pump and then to the holding tank or treatment tank. To Operate:

1. Turn ON the WATER PUMP breaker.
2. Turn ON the HEAD SYSTEM breaker.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

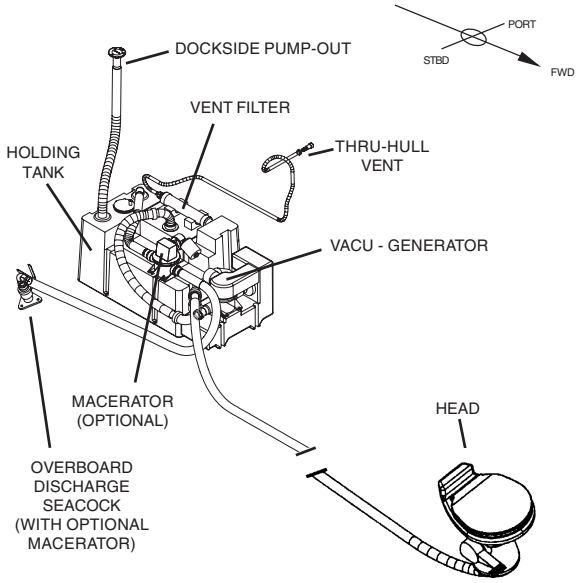
C. HOLDING TANK OPERATION

Waste from the head is directed into the holding tank located in the engine room. The holding tank fluid level indicator is located on the main distribution panel or in the head which indicates 3/4 FULL, FULL and DO NOT FLUSH, or on some models may read FULL,1/2, or EMPTY. When the FULL light is on, the DO NOT FLUSH light will also be on. When these lights are ON, the holding tank must be emptied before the head can be reused.

DOCKSIDE PUMP-OUT

To empty holding tank, the services of a dockside pump out station will be needed. Follow instructions at the station and make sure pump out station hose is inserted into the deck plate marked WASTE. The holding tank can also be emptied through utilization of the macerator (if supplied) (see *Macerator* in this section).

VACUFLUSH® HEADWITH HOLDING TANK, DOCKSIDE PUMP-OUT & OPTIONAL MACERATOR (FIG. 7.11.2)



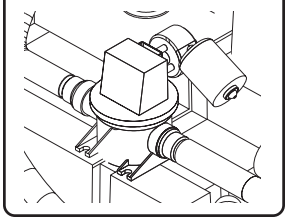
D. VENT FILTER

The vent filter is designed to control odors associated with the head system operations. The vent filter is located on the holding tank. **The filter must be changed at the beginning of each boating season to be effective.** The vent filter is installed in-line on the holding tank ventilation hose (Figure 7.11.2).

Note: Do not over fill the holding tank as this will flood the vent filter and render it useless. Filter replacement will then be required. See Parts Manual for correct replacement filter.

E. MACERATOR DISCHARGE PUMP WITH SEACOCK INTERLOCK SYSTEM (OPTIONAL)

MACERATOR
(FIG. 7.12.1)



The macerator gives the boat operator the means of discharging the holding tank contents directly overboard through a seacock in the bottom of the hull. This option is available in conjunction with the dockside pump out. **DISCHARGE OF SEWAGE DIRECTLY OVERBOARD IS FOR USE ONLY WHERE APPROVED.**

Since direct overboard discharge is prohibited in many areas, the macerator seacock is normally closed. The macerator seacock is equipped with a system interlock switch which prevents the operation of the macerator when the macerator seacock is closed. The light on the MACERATOR switch on the DC Distribution Panel will be lighted when the macerator is operational. If the light is not lighted, it is visual confirmation the macerator seacock is closed and that the macerator cannot be operated. Check that the macerator seacock handle is in the open position and the light on the switch is lighted before operating the macerator.

NOTICE

This boat may be equipped with an optional overboard discharge valve.

Discharging of sewage directly overboard is for use where approved only.

TO OPERATE THE MACERATOR:

1. Turn the DISCHARGE PUMP breaker ON and open the macerator seacock located on the engine room floor.
2. Operate discharge switch located on the DC Distribution Panel in the salon.
3. When tank is empty, release the switch and close the macerator seacock.
4. Turn the DISCHARGE PUMP breaker OFF.

MAINTENANCE

Prior to each use and at regularly scheduled intervals (see Section 11 – *Service Guide*), cycle the macerator seacock handle open and shut to ensure proper operation of the seacock.

NOTICE

There is a possibility of being fined for having an operable direct overboard discharge of waste in some waters. Removing the seacock handle, in the closed position, or other means must be used to avoid fine.

It is illegal for any vessel to dump plastic trash anywhere in the ocean or navigable waters of the United States.

7. ENTERTAINMENT CENTER

The entertainment center equipment options may vary from boat to boat. Refer to the Owner's Manual Packet to find individual instructions for the equipment installed on your boat.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

A. TELEVISION SIGNAL SELECTOR & ANTENNA TUNER

The antenna/cable selector panel is located in the galley inside the storage compartment below the TV. Turn the selector to MAX GAIN for onboard TV antena reception. Turn the selector to SHORE for dockside cable reception.

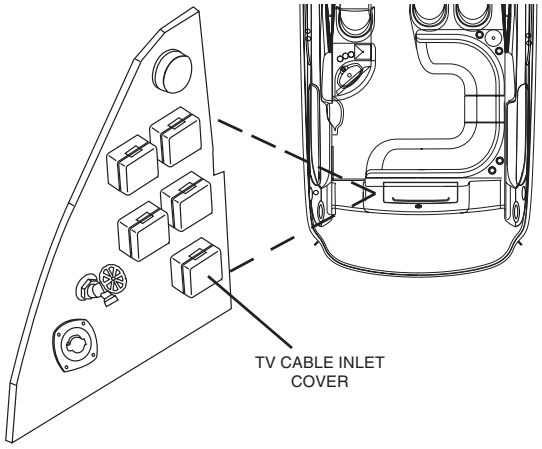
TV SIGNAL SELECTOR & ANTENNA TUNER
(FIG. 7.13.1)

B. CABLE TELEVISION CONNECTION

The dockside TV cable inlet is located in the transom storage compartment next to the shore power inlet .

1. Open the TV cable inlet cover.
2. Connect the TV coax cable to the TV cable receptacle.
3. Run the cable to the dockside receptacle and connect coax cable into receptacle.

CABLE TELEVISION CONNECTION
(INSIDE TRANSOM STORAGE COMPARTMENT)
(FIG. 7.13.2)



C. 12 VOLT STEREO

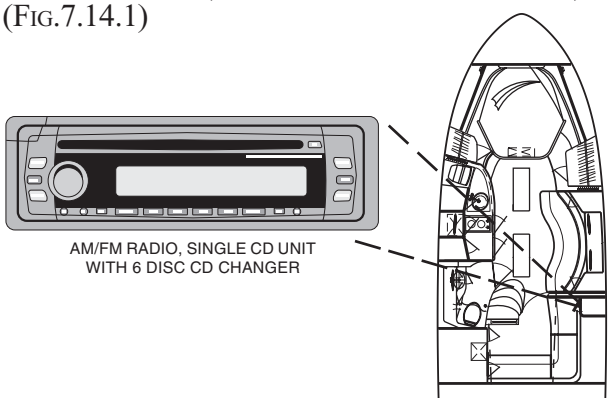
The 12 volt AM/FM radio single CD stereo is located on the AC/DC Main Distribution Panel cabinet in the salon between the sofa and mid-stateroom.

The system includes four (4) speakers in the cabin, four (4) water resistant speakers in the cockpit, and a digital remote control located at the control station.

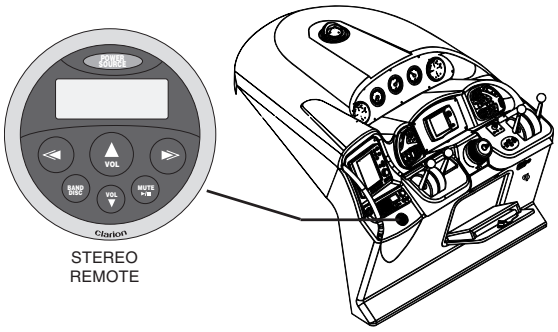
The stereo is protected by the stereo breaker on the cabin DC distribution panel. The power source and breaker protection for the stereo memory is on the main DC breaker panel in the engine room. Power to stereo memory is maintained even if the battery switch is off.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

STEREO SYSTEM (12 VOLT AM/FM SINGLE CD) (FIG.7.14.1)



STEREO REMOTE (LOCATED ON THE DASH) (FIG. 7.14.2)



8. TELEPHONE SYSTEM

The telephone option consists of a waterproof inlet, and 50 foot (15 meter) shore cord and telephone outlet in the salon on the aft end of the sofa. The dockside telephone inlet is shared by the TV cable inlet inside the same waterproof cap. The inlet is located next to the shore power inlet. The Telephone/ TV cable inlte is located in the transom storage compartment.

TELEPHONE SYSTEM HOOKUP

1. Open the telephone/TV cable inlet cover.
2. Connect shore cord to dock telephone inlet and then to the boat inlet.
3. Telephone outlet(s) in the boat are now operational.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

9. AUTOMATIC FIRE EXTINGUISHER SYSTEM

AUTOMATIC FIRE EXTINGUISHER (FIG. 7.14.3)

Your boat is equipped with an automatic fire extinguisher system located forward of the engines. In the event of a fire, the heat sensitive automatic head will release the extinguishant as a vapor, totally flooding the area in fire-killing concentrations.

WHEN ACTUATION OCCURS, IMMEDIATELY SHUT DOWN ALL ENGINES, POWERED VENTILATION, ELECTRICAL SYSTEMS AND EXTINGUISH ALL SMOKING MATERIALS. DO NOT IMMEDIATELY OPEN THE ENGINE COMPARTMENT!! THIS FEEDS OXYGEN TO THE FIRE AND FLASHBACK COULD OCCUR.

Allow the exinguishant to "soak" the compartment for at least fifteen (15) minutes and for hot metals or fuels to cool before cautiously inspecting for cause of damage. Have portable extinguishers at hand and ready. Do not breathe fumes or vapors caused by the fire.

A. GASOLINE ENGINE BOATS

The system indicator light is wired to the ignition and is turned ON when the ignition is turned ON.

GASOLINE AUTOMATIC FIRE EXTINGUISHER INDICATOR LIGHT (FIG. 7.14.4)

AUTOMATIC
HALON SYSTEM

1. **LIGHT ON-UNIT CHARGED**
2. **LIGHT OFF-UNIT DISCHARGED**
3. **IF SYSTEM DISCHARGES. SHUT DOWN ENGINE(S), BLOWERS AND ELECTRICAL SYSTEMS**

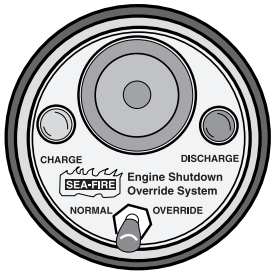
The indicator light, located on the dash panel, indicates to the helmsman when the unit has discharged. Under normal circumstances, when the ignition is ON the charge indicator light is ON. If the unit discharges, the light wll go OFF.

B. DIESEL ENGINE BOATS

The system indicator and switch module, ENGINE SHUTDOWN OVERRIDE SYSTEM, is wired to the ignition and turned ON when the ignition is turned ON. The CHARGE and DISCHARGE indicator lights, indicate to the helmsman when the unit has discharged. Under normal circumstances, when the ignition is ON the CHARGE indicator light is ON. If the unit discharges, the CHARGE light wll go OFF and the DISCHARGE light will turn ON. The system incorporates an engine shutdown switch with override system. When the system discharges it will turn off the engines.

After the engine room has been inspected and it has been determined safe and you are ready to restart the engines, activate the OVERRIDE switch on the ENGINE SHUTDOWN OVERRIDE SYSTEM. Then restart the engines.

DIESEL AUTOMATIC FIRE EXTINGUISHER INDICATOR LIGHTS, BUZZER AND OVERRIDE SWITCH (FIG. 7.15.1)



REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

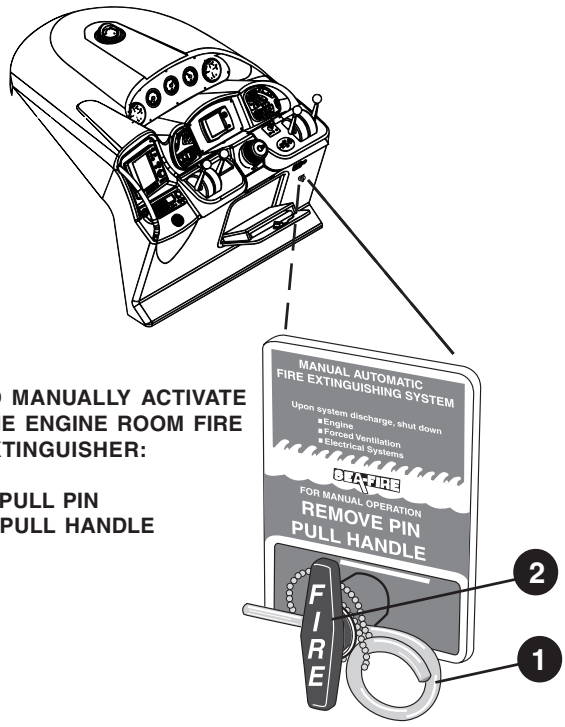
C. MANUAL FIRE EXTINGUISHING SYSTEM PULL HANDLE

Located at the control station, the manual fire extinguisher system allows the operator to manually activate the automatic extinguisher in the engine room Early detection and use of the manual override system will reduce fire damage by eliminating the time necessary for heat in the engine room to rise to a temperature necessary to activate the automatic fire extinguisher.

TO OPERATE:

1. Pull pin securing the handle.
2. Pull red FIRE handle quickly and briskly.

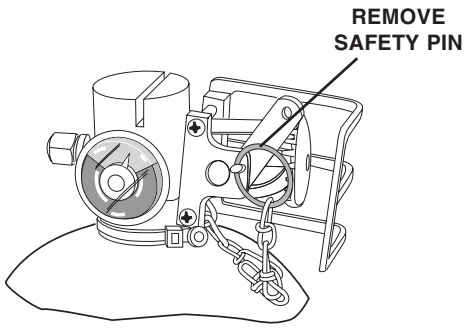
MANUAL FIRE EXTINGUISHING SYSTEM PULL HANDLE (FIG. 7.15.2)



D. SAFETY PIN

The safety pin is used on boats equipped with the Manual Fire Extinguishing System Pull Handle. The safety pin, located at the neck of the extinguisher bottle in the engine room is for shipping and transfer of the bottle only. The pin MUST be removed in order to manually operate the system.

ENGINE ROOM FIRE EXTINGUISHER
(FIG. 7.16.1)



NOTE: THE MANUAL SYSTEM WILL NOT OPERATE IF SAFETY PIN IS INSTALLED.

10. REFRIGERATOR/FREEZER

12 VOLT DC SYSTEM

The 12 volt system utilizes a REFRIGERATOR breaker located on the main distribution panel. To operate the unit on 12 volt power, preferably with engines operating, turn the switch on the refrigerator to ON.

AC Voltage System

The refrigerator operates on the AC voltage shore power system, or onboard generator (if applicable). To operate the unit on AC power, connect the shore power system, turn the MAIN breaker ON then turn the REFRIGERATOR breaker ON.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

⚠ CAUTION

Do not cover refrigerator vents.

11. POWER VENTILATION SYSTEM

The power ventilation system removes stagnant air and odor from the head and galley by means of 12 volt exhaust fans mounted to the bulkhead. They are powered by the POWER VENTS breaker on the cabin DC distribution panel and turned ON and OFF by the switch in each location.

12. COFFEE MAKER

The drip coffee maker operates on the AC electrical system. It is protected by the "GALLEY SYSTEMS" breaker on the main distribution panel which must be ON to operate the coffee maker.

To keep the coffee maker operating efficiently, the mineral deposits left by water must be flushed out using the cleaning method described in the instruction booklet.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

13. STOVES

The electric stove operates on the AC voltage shore power system, or onboard generator (if applicable).

The 120 volt STOVE breaker on the main distribution panel supplies power to the stove and must be ON to operate the stove.

STOVES WITH LIDS:

A safety switch on the lid recess deactivates the power switch, turning off power to the stove control knobs when the lid is installed.

REFER TO THE STOVE OPERATOR'S MANUAL FOUND IN YOUR OWNER'S MANUAL PACKET FOR DETAILED OPERATING INSTRUCTIONS AND WARRANTY.

⚠ WARNING

DO NOT use this appliance for comfort heating.

14. MICROWAVE

The AC voltage MICROWAVE breaker on the main distribution panel supplies power to the microwave and must be ON to operate unit.

REFER TO THE MICROWAVE OPERATOR'S MANUAL FOUND IN YOUR OWNER'S MANUAL PACKET FOR DETAILED OPERATING INSTRUCTIONS AND WARRANTY.

15. CANVAS

⚠ DANGER

If the cockpit is totally enclosed with canvas covers and curtains while the engine is running or boat is moving, carbon monoxide will build up and cause death or permanent injury.

Do not use the rear (aft) curtain or camper top while engine is running or boat is moving.

The Bimini Top or sunshade should not be used when the vessel speed exceeds 45 MPH. Damage to the boat or Bimini may occur.

Attached to the inside of the Bimini Top is a DANGER tag for Carbon Monoxide Gas (CO) buildup and a WARNING tag for limiting speeds when Bimini Top canvas is installed. The rear (aft) curtain also has a WARNING tag stating "The Aft Curtain must not be used while engine is running or boat is underway". If your canvas does not have these tags, they become lost or are unable to be read, contact your dealer for replacement labels.

For your safety, decide which canvas pieces you want to remove or install before you leave the boat slip or off-load your boat from the trailer into the water. Removing or installing canvas on the water can be difficult since rough water or wakes can cause you or your passengers to lose their balance while attempting canvas removal or installation.

⚠ DANGER

Exhaust fumes from engines contain deadly carbon monoxide gas (CO). Boats enclosed with canvas or with poor ventilation are most likely to collect fumes.

CO sickness symptoms include headache, nausea and dizziness. Do not mistake these symptoms for sea sickness.

Ventilate boat. See Section 1.4, Carbon Monoxide, for more details.

For safety and ease of installation and removal of canvas, use at least two people. Know which canvas piece(s) that you are to install or remove.

The standard canvas set consists of the following pieces:

Sunbrella® Bimini Top and Boot
Front Curtains — Side Curtains
Aft Sunshade — Aft Curtain
Canvas Storage Bag

The following canvas options are available:

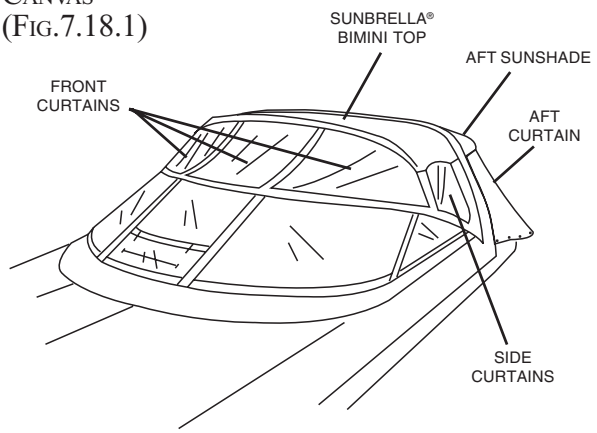
Cockpit Cover

⚠ DANGER

In rainy weather and/or cold weather, fresh air must circulate through boat to avoid carbon monoxide poisoning.

See Section 1.4, Carbon Monoxide, for more details.

CANVAS
(FIG.7.18.1)



A. INSTALLATION TIPS

- Zippers: Zippers are located on each canvas piece. Make sure canvas is centered over the metal canvas support rods (bows). When attaching any canvas piece, zip the zippers only partially. This helps to hold the piece in place and relieves tension, helping the other sides zip or snap easier. After all the sides of the piece are snapped in place, finish zipping all the zippers. This will ensure a tight fit.
- Adjustable Support Rods: Adjustable support rods are located on the Convertible and Bimini Top. There is an outside tube and an inside tube. Push in the button to adjust for longer or shorter rod lengths.

B. CANVAS CARE AND MAINTENANCE

See Section 9, for instructions on the care and maintenance of your canvas.

16. ELECTRIC WINDSHIELD VENT

To operate the vent, turn on the battery switch. To open or close vent, push VENT OPEN or VENT CLOSE switch on the control station switch panel.

17. HORN

ELECTRIC HORN

The horn is operated by a momentary switch on the dash and has a breaker under the dash on the control station DC breaker panel.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

18. SPOT LIGHT (OPTIONAL)

TO OPERATE THE SPOT LIGHT:

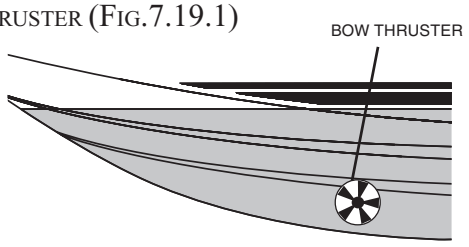
1. Turn ON the SPOTLIGHT switch on the dash switch panel.
2. Press POWER button on spot light control pad.
3. Press arrow buttons to direct spot light.
4. Press the SPEED button to select horizontal travel speed of spot light.

REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

19. BOW THRUSTER (OPTION)

The optional bow thruster is electrically driven. The bow thruster enhances maneuverability of the bow when docking or performing other maneuvers which requires increased operator control.

BOW THRUSTER (FIG.7.19.1)



REFER TO OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

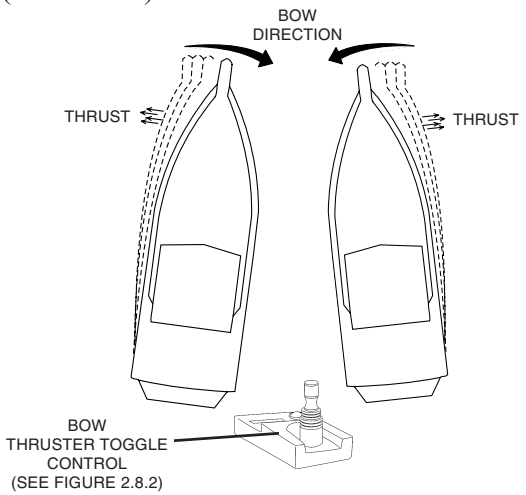
THE BOW THRUSTER WILL ADD THE FOLLOWING EQUIPMENT TO YOUR BOAT:

- **Bow Thruster** - located under the forward master stateroom bunk.
- **Joy Stick**- Controls direction of thrust.
- **Battery Switch** (12V Bow Thruster) - A dedicated switch on the accessory board in the engine room (see figure 6.12.1).
- **Fuse Protection** - Located on the accessory board in the engine room below bow thruster battery switch. (250 amp ignition protected) (see figure 6.12.1)

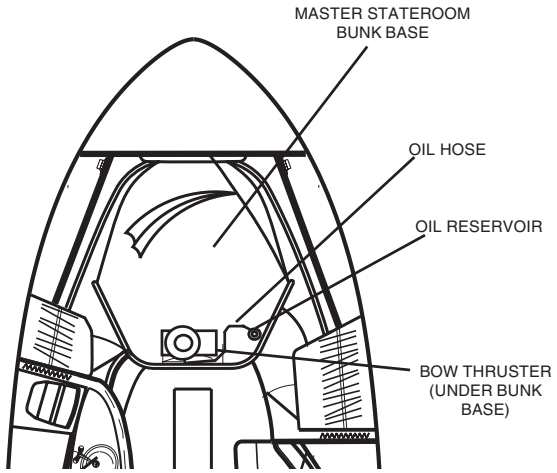
NOTICE

If breakers or fuses fail, always replace with the same amperage device. NEVER ALTER overcurrent protection.

BOW THRUSTER OPERATION (FIG. 7.19.2)



BOW THRUSTER (OPTIONAL) (FIG. 7.19.3)

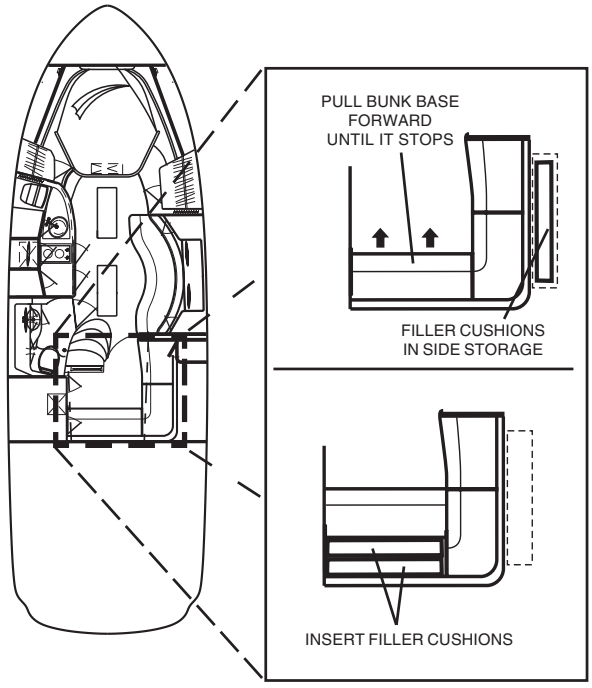


20. AFT BERTH SLEEPING CONVERSION

To convert the aft seating area into a bed:

1. Pull out the center base until it stops.
2. Remove two backrest lower cushions.
3. Insert backrest cushions on bunk.

AFT BERTH SLEEPING CONVERSION
(FIG. 7.20.1)

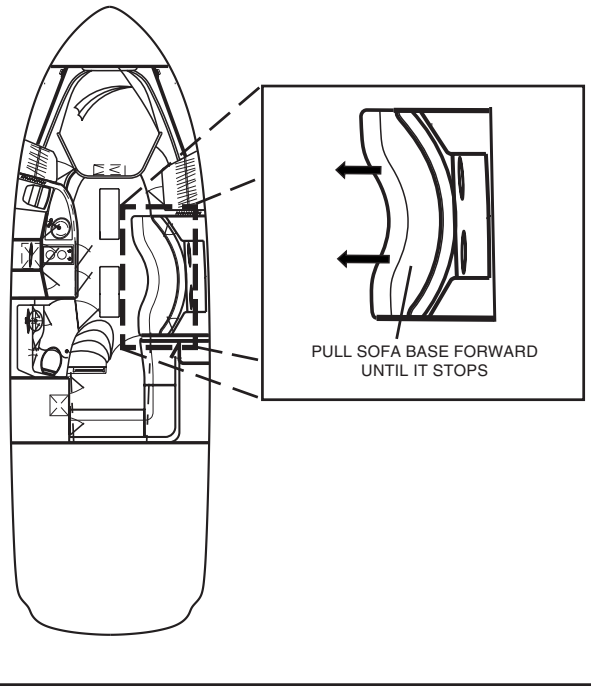


21. SALON SOFA SLEEPING CONVERSION

To convert the salon sofa into a bed:

1. Pull out the sofa base until it stops.

SALON SOFA SLEEPING CONVERSION
(FIG. 7.20.2)



Section 8 • Required Inspection, Service and Maintenance

Routine inspection, service and maintenance of your boat's systems are vital to assure your safety, as well as for prolonging the life of your boat. You should develop regular routines for inspecting your boat. The chart below summarizes inspection, service and maintenance activities. This section also contains descriptions of some convenient methods for evaluating the condition of some of your boat's systems.

The interval between necessary service or maintenance is highly variable, depending on the environment your boat is in, and on the severity of operating conditions. For example, corrosion of parts on boats operated in salt water proceeds much faster than the corrosion of parts on a boat operated in fresh water. The intervals listed below are recommended maximums, and you must reduce the time between inspections if your observations indicate the need.

1. Summary Guide for Inspection, Service and Maintenance

			INTERVAL				
ITEM	**REQUIRED MAINTENANCE/SERVICE**	**REFERENCE SOURCE**	**BEFORE EVERY USE**	**AFTER FIRST 20 HOURS**	**EVERY 25* OR 50 HOURS**	**EVERY 50* OR 100 HOURS**	**EVERY 6 MOS. OR ANNUALLY**
Battery	Check water level	Owner's Manual p. 6.1	•	•	•		
Bilge Area	Clean and check	Owner's Manual p. 4.1					•
Bilge Blowers	Hose connections tight	Owner's Manual p. 4.2			•		•
Bilge Pump	Float switch operates freely	Owner's Manual p. 4.1					•
Canvas	Clean	Owner's Manual p. 9.3	As Needed				
Controls							
Steering	Check for proper operation		To be done by Sea Ray dealer every six months				
	Power steering oil level	Engine Manual	•				
Gear Shift & Throttle	Lubricate. Include all shift	Engine Manual		•		•	•
	linkage and pivot points						
Electrical							
Connections	Check for looseness		To be done by Sea Ray dealer annually				
***GFCI (AC) Outlet*	Check for operation	Owner's Manual, Section 6					•
Engine							
Alarm	Check	Engine Manual	•				
Cooling System	Check for leaks	Engine Manual	•				
Connections	with engine running						
Crankcase ventilating system	Clean	Engine Manual		•		•	
Drive belts	Check	Engine Manual	•				
Exhaust System	Check for leaks	Engine Manual	•	•		•	
Flame Arrestor	Clean	Engine Manual		•		•	
Fuel Filter	Replace	Engine Manual				•	
Mounts (Fasteners)	Tighten	Engine Manual		•			•
Oil and Filter	Replace	Engine Manual				•	•
Oil Level	Check	Engine Manual	•				
Stern Drive (With Stern Drive Engine Option)							
Fluid level	Check level	Engine Manual	•				
Fluid	Replace	Engine Manual					•

**Use in salt water or other severe operating conditions requires shorter maintenance/service intervals*

***May not be on your boat*

SECTION 8 • REQUIRED INSPECTION, SERVICE AND MAINTENANCE

SUMMARY GUIDE FOR INSPECTION, SERVICE AND MAINTENANCE

			INTERVAL				
ITEM	**REQUIRED MAINTENANCE/SERVICE**	**REFERENCE SOURCE**	**BEFORE EVERY USE**	**AFTER FIRST 20 HOURS**	**EVERY 25* OR 50 HOURS**	**EVERY 50* OR 100 HOURS**	**EVERY 6 MOS. OR ANNUALLY**
Fuel System							
Connections & Lines	Check for leaks	Engine Manual	•	•	•		
Tanks	Check for leaks	Owner's Manual, Section 5	•	•	•		
Water Separating Fuel Filter	Replace	Engine Manual		•			•
Sliding Seats and Ladder							
Helm Seat	Spray slider with light coating of spray lubricant				•		
Transom Swim Ladder	Spray slider with light coating of spray lubricant				•		
Propeller	Inspect for damage		Always after striking object				
Seaworthiness							
Bilge drain plug	Installed and tight	Owner's Manual p. 4.1	•				
Hull damage Stern drive	Check for loose, damaged or missing parts		Always after striking object				
Topside & Supplies	Check for loose, damaged or missing parts	Owner's Manual p. 8.5					•
Anchor rope	Check rope for wear						•
Transmission							
Oil Strainer Screen	Clean		To be done by Sea Ray dealer annually				
Trim Tabs							
Fluid	Check and add as needed	Trim Tab Manual		•			
Zincs							
Transom Zinc	Check and replace as needed	Owner's Manual p. 6.21, 6.22	Every 25 hours of operation				
Trim Tabs	Check and replace as needed	Trim Tab Manual	Every 25 hours of operation				

***Use in salt water or other severe operating conditions requires shorter maintenance/service intervals**

****May not be on your boat**

2. USEFUL SERVICE INFORMATION

OWNER _____

HOME PORT _____

BOAT NAME _____

REGISTRATION NUMBER _____ STATE _____

HULL SERIAL NUMBER _____

WARRANTY REGISTRATION DATE _____

ENGINE MAKE & MODEL _____

SERIAL NUMBER PORT _____ STARBOARD _____

GEAR MAKE & REDUCTION RATIO _____

SERIAL NUMBER PORT _____ STARBOARD _____

PROPELLER SIZE PORT _____ STARBOARD _____

PART NUMBER PORT _____ STARBOARD _____

SHAFT SIZE (DIAMETER X LENGTH) _____ MATERIAL _____

FUEL CAPACITY PORT TANK _____ STARBOARD _____

WATER CAPACITY _____

KEY NUMBER, IGNITION _____ DOOR _____

SELLING DEALER _____

CITY & STATE _____

LENGTH _____ BEAM _____ DRAFT _____

VERTICAL CLEARANCE _____

ESTIMATED WEIGHT _____

GENERATOR SERIAL # _____ MODEL # _____ KILOWATTS _____

3. INSPECTION, SERVICE AND MAINTENANCE PROTOCOL

A. BILGE AREA

Many of your boat's systems have critical features located in the bilge area. A thorough and organized inspection of the bilge area will address many of these critical features. For example, engine oil leaks and fuel system leaks will show themselves as contamination on the surface of the liquid that remains in the bilge. When you see such contamination, you should look for its source.

Once or twice a year, pump the bilge areas dry and remove all loose dirt. Be sure that all the limber holes are open. Limber holes are the openings in the stringers that allow water to flow from the outboard areas of the bilge to the bilge sump.

Check the bilge pump float switch by moving it manually. (Figure 4.2.3) The bilge pump should start when the float switch is raised and should stop when lowered. If it does not, first try resetting the bilge pump breakers, if the pump will still not run replace the float switch before using your boat. The float switch should also move freely without sticking, if it does not, have it serviced or replaced before boating.

⚠ WARNING

DO NOT USE FLAMMABLE SOLVENTS to clean any part of the bilge.

Fumes can accumulate and can be the source of an explosion.

1. OIL

If there is oil contamination, look for leaks in engine oil lines and engine gaskets. If parts of the bilge have been stained by oil, the stain can be removed using a bilge cleaner available from your dealer or a marine store.

2. ENGINE

Engine failure or malfunction, when away from shore, can be dangerous. Make certain you do the following each time you use the boat:

- Wipe off the engine to remove accumulated dust, grease and oil.
- Check all exposed nuts, bolts and screws for tightness.
- Inspect the belts for wear. If they do not require replacement, check and adjust the belt tension according to the engine manufacturer's recommendation.
- Inspect engine wiring, and clean and tighten the terminals on the engine electrical system.
- Clean and lubricate the battery cables.
- Add distilled water to the battery cells as needed.
- Refer to your Engine Operator's Manual for additional engine maintenance requirements.

3. FUEL SYSTEM

- Inspect the entire fuel system for evidence of leakage, including the fuel tank fill lines and vents. Any stain around a joint could be an indication of a leak.
- Test all fittings with a wrench to be sure they are not loose, but do not forcefully overtighten the fittings.
- Clean fuel filters and vent screens.

⚠ WARNING

Work on electrical wiring can create shock hazards or sparks.

Always shut off battery switch, breakers and/or pull fuses before checking electrical wiring or connectors.

4. Wiring System

- Check all wiring for proper support.
- Check all wiring insulation for signs of fraying or chafing.
- Check all terminals for corrosion - corroded terminals and connectors should be replaced or thoroughly cleaned.
- Tighten all terminals securely and spray them with light marine preservative oil.

5. Fittings, Hoses and Clamps

- Inspect the entire bilge area for evidence of damage or deterioration. Evidence of deterioration will first appear around hull fittings, hoses and clamps.
- Straighten kinked hoses.
- Replace any hose that does not feel pliable.
- Check all hose clamps for tightness and corrosion. Corroded clamps must be replaced.
- Check the nuts, bolts and screws that retain equipment, hoses, etc. in the bilge for tightness and corrosion. Corroded fasteners must be replaced.

B. Topside and Supplies

Once a year, you should undertake a thorough review of the topside equipment, as well as of the critical safety supplies on your boat.

- Check cleats, rings, rails, etc. for loose or corroded fasteners, breaks, sharp edges or other conditions that could lead to malfunction or unsafe use. Repair or replace as necessary.
- Inspect PFDs (life jackets) for tears and deterioration.
- Make certain you have enough PFDs on board for the maximum number of persons you can carry.
- Check your first aid kit, making certain it is complete and that the items in it have not passed an expiration date.
- Check the signaling equipment and emergency flares. Make sure all items are within their expiration dates.
- Inspect the anchor, mooring and towing lines. Repair or replace as required.
- Check fire extinguishers for full charge.

4. Winterization Checklist for Boats Stored on Land

A. Boat Storage

- Store boat in a bow high attitude.
- Remove hull drain plug.
- Pour one (1) pint (half-liter) of 50% water/ antifreeze mixture in each bilge pump sump.

B. Engines

- Flush engines with fresh water.
- Remove engine drain plugs.

REFER TO YOUR ENGINE OPERATOR'S MANUAL FOR DETAILED INFORMATION ON PREPARING THE ENGINES FOR STORAGE AND WINTERIZATION.

C. Battery(ies)

- Remove from boat. Remove the negative (-) cable first, then the positive (+) cable.
- Remove grease and dirt from top surface.
- Grease terminal bolts.
- Store on wooden pallet or thick plastic in a cool dry place. Do not store on concrete.

- Keep under a trickle charge.
- When placing battery back into service, remove excess grease from terminals, recharge as necessary and reinstall in boat.

D. HEAD SYSTEM

- Flush entire system thoroughly with fresh water.
- Pump out holding tank.
- Remove water line from inlet fitting located on back bottom half of water valve on head.
- Flush one gallon (four liters) antifreeze mixed with one gallon (four liters) of water through toilet and let vacuum pump run for one or two minutes.
- Shut WATER SYSTEM breaker OFF.
- Pump out holding tank.

E. WATER SYSTEM

- Turn ON the WATER SYSTEM switch.
- Open water faucet, let system drain completely.
- Turn OFF the WATER SYSTEM switch.
- Water must be removed from the water lines with air pressure or flushed with a nontoxic antifreeze.

Using pressurized air to remove water from water lines:

- You must have an air compressor with air hose and air nozzle.
- Remove water hoses from water pump.
- Alternate opening one faucet at a time to make sure water is removed from each line.
- Blow air through the water lines removed from the water pump.

NOTE: When blowing air be careful not to blow air with all faucets closed. System could be damaged by overpressurization and create water leaks.

- Cover hose ends with screen or broad weave cloth and tape in place to keep out dirt and bugs.

USING NONTOXIC WINTERIZING ANTIFREEZE:

- Purchase a nontoxic winterizing antifreeze for fresh water systems from a marine or RV supply retailer.
- With all water pumped out of the system add nontoxic antifreeze to the water tank. Pour in enough to be pumped to all faucets and showers.
- Close all faucets and turn on water system.
- Open one faucet at a time. Close faucet when nontoxic antifreeze comes out of faucet.
- After all faucets and showers have been treated, open all faucets and pump out remaining nontoxic antifreeze.

WATER HEATER WINTERIZATION

- Refer to your water heater Owner's Manual for detailed information on preparing water heater for storage and winterization.

F. FUEL SYSTEMS

GASOLINE:

- Fill fuel tank with gasoline and the recommended amount of stabilizer and conditioner such as "Stabil®".
- Run engine(s) for ten minutes to ensure that all gasoline in the carburetor and fuel lines are treated.

DIESEL

- Fill fuel tank with diesel and recommended amount of biocide, "Biobor®", which prevents bacteria and fungi from contaminating diesel fuel that contains some water.
- Diesel fuel should also get a petroleum distillate additive, such as "Stabil®" or Racor® RX100". This will absorb water in the fuel and prevent freezing problems.
- Run engine(s) for ten minutes to ensure that all diesel fuel in injectors and fuel lines is treated.

DETAILED WINTERIZING, OPERATING INSTRUCTIONS AND WARRANTY INFORMATION ARE PROVIDED BY THE EQUIPMENT MANUFACTURER AND CAN BE FOUND IN THE OWNER'S PACKET.

⚠ CAUTION

Do not overfill. Filling a tank until the fuel flows from vents is dangerous. Allow room for expansion.

5. FITTING OUT AFTER STORAGE

A. FUEL SYSTEM

Check the entire fuel system for loose connections, worn hoses, leaks, etc. and repair. This is a primary safety precaution.

Check fuel lines for damage and make sure that they do not come in contact with any moving parts.

B. BATTERY (IES)

Before installing the batteries, clean the terminal posts with a wire brush or steel wool and then attach the cables. After the cable clamps are tightened, smear the post and clamps with vaseline or grease to exclude air and acid. Do not apply grease before attaching and tightening the terminal clamps. Examine all wiring.

C. MISCELLANEOUS

- Check all thru-hull fittings for unobstructed water passage. Be alert for any deteriorated hoses and/or fittings below the water line which might fail in service and admit water.
- Test the navigation lights.
- Check all wiring for loose connections.
- Check all switches and equipment for proper operation.
- Check bilge blowers for proper operation. Turn ON blowers and place hand over hull blower vent to make sure air is coming from vent.
- Anchor lines and gear should be inspected and replaced if necessary.
- Make sure the hull drain plug is in place and tight.
- Clean bilge thoroughly if it was not done at lay-up.
- Check all engine fluid levels.
- Check fuel lines for damage and/or leaks. Make sure that they do not come into contact with moving parts.

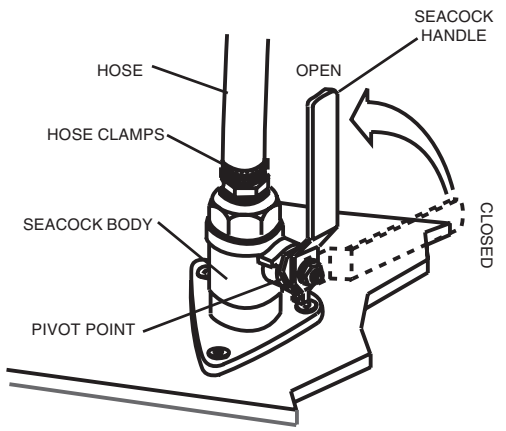
6. SECURITY CONSIDERATIONS

Be conscious of the security of your boat. Always remove the keys from the ignition, lock hatches, lock the cabin door, remove and stow any removable electronic gear (fishfinders, GPS, etc.) and personal gear (fishing poles, etc.) normally left aboard your boat.

7. SEACOCK LUBRICATION

- With boat out of water, remove the hose from top of the seacock.
- Put seacock handle in closed position.
- Add a few drops of lubricating oil inside.
- Work handle back and forth a few times. Add oil as needed.
- Replace hose and tighten clamp.
- Add a few drops of oil to the handle pivot point.

SEACOCK
(FIG. 8.8.1)



8. QUICK REFERENCE CHECKLIST

As the owner/operator of a Sea Ray® boat, you are responsible for the safe operation of your boat and the safety of your passengers. Always be sure that required documents, navigational equipment and Coast Guard required safety equipment is aboard and in proper working order.

A. BOARDING THE BOAT*

GENERAL

1.	Weather Conditions	Is it going to be safe to go out
2.	Transom Drain Plug	Installed
3.	PFDs and All Other Coast Guard Required Safety Equipment	Available for all children and adults
4.	Ignition Keys	Available
5.	Tool Box	Stocked with a variety of appropriate tools

BOAT SYSTEMS

1.	Bilge Pumps	Working. Discharge any appreciable amounts of water overboard
2.	Blowers	Working. “Sniff” the bilge/engine compartment for fuel odor
3.	Navigation Lights	Working. Have spare bulbs (and if applicable fuses) aboard
4.	Radio/Electronics	Working
5.	Horn	Working
6.	Trim Tabs	Full range of motion. No excessive play or binding
7.	Fresh Water Tank	Filled and sanitized
8.	Head System Holding Tank	Empty
9.	Seacocks	Engines & Generator Open (handle parallel to hose), Head System Holding Tank Closed (handle perpendicular to hose)

ENGINE

1.	Batteries	Fully charged (Check water cell levels)
2.	Fuel Tank	Filled with recommended fuel
3.	Fuel System	Check for leaks
4.	Fuel Filters	Check that filters are clean and tight
5.	Diesel Racor Fuel Filters	Check that filters are clean, tight and free of water
6.	Engine Coolant Drain Plugs	Secured
7.	Steering Fluid	Full
8.	Throttle & Gearshift Controls Test	Full range of motion

***Note:** Many of these items should be checked before leaving the house.

QUICK REFERENCE CHECKLIST (CONT'D)

B. PREPARING TO DEPART AND AFTER LAUNCHING

GENERAL

1.	Bilge/Engine Compartment	"Sniff" the bilge/engine compartment for fuel odor. Run the bilge blowers for at least four (4) minutes.
2.	Shore Power Cable	Disconnected from dockside power inlet
3.	Lines, Fenders and Anchor	Ready for use
4.	Passengers/Crew	Instructed in duties for getting underway and fitted for a correct size PFD

ENGINE

1.	Battery Switches	In the ON position
2.	Fuel Valves (Diesel Only)	Open
3.	Engine Alarm	Test. Should sound after a few seconds
4.	Gear Shift & Throttle Controls	In NEUTRAL and IDLE positions

STARTING THE ENGINE*

1.	Gearshift & Throttle Controls	Shift in NEUTRAL (Refer to your Engine Owner's Manual for startup procedures for your specific engine)
2.	Ignition	Turn master ignition keys on DC distribution panel to the ON position. Depress ignition switch on the helm switch panel to START position until engine starts, then release to RUN position (light on).

IMPORTANT: Do not continue to operate starter for more than 10 seconds without pausing to allow starter motor to cool off for 2 minutes. This also will allow the battery to recover between starting attempts.*

⚠ WARNING

Do not run the engine or generator in an enclosed area, such as a closed boat house, as there is the possibility of buildup and inhaling of carbon monoxide.

*If engine fails to start, refer to the Engine Owner's Manual for further troubleshooting procedures

QUICK REFERENCE CHECKLIST (CONT'D)

C. WHILE UNDERWAY

GENERAL

1.	Passengers/Crew	Safely seated with PFD's on or immediately accessible
2.	Lines, Fenders and Anchor	Stowed

BOAT SYSTEMS

1.	Trim Tabs	Bring boat to "On Plane". Adjust as neccessary
2.	Navigation Lights	On at night or in reduced visibility

ENGINE

1.	Tachometers	Engines operating in safe RPM range
2.	Engine Gauges	Continually monitor
3.	Engine Operation	Check idle and shift. Listen for abnormal noises and visually check the engine compartment while underway

D. RETURNING TO PORT

GENERAL

1.	Passengers/Crew	Instructed in duties for line handling
2.	Lines and Fenders	Ready for use

BOAT SYSTEMS

1.	Navigation Lights	Turned OFF when secured
2.	Anchor Light	ON if necessary
3.	Bilge/Engine Compartment	"Sniff" the bilge/engine compartment for fuel odor. Run the bilge blowers if necessary. Check for water in bilge. Run bilge pumps if necessary

ENGINE

1.	Throttle & Gearshift Controls	Bring to IDLE and NEUTRAL positions
2.	Tachometers	Idle the engines for five (5) minutes to cool down

QUICK REFERENCE CHECKLIST (CONT'D)

3. Ignition ..... Depress ENGINE STOP switches on the helm switch panel when engines are cooled down.
4. Engine Operation ..... Check idle and shift. Listen for abnormal noises

E. SECURING THE BOAT

GENERAL

1. Lines and Fenders ..... Fenders in place, lines tied securely to dock
2. Shore Power Cable ..... Connected to dockside power inlet

BOAT SYSTEMS

1. Seacocks ..... Closed (handle perpendicular to hose)
2. Helm Switch Panel ..... All switches in the OFF position
3. Gearshift & Throttle Controls ..... In the NEUTRAL and IDLE positions

ENGINE

1. Ignition ..... Switched in the OFF position (lights off) and master ignition keys removed from DC distribution panel
2. Battery Switches ..... In the OFF position
1. Fuel Valves (Diesel Only) ..... Closed (handle perpendicular to hose)

F. IF THE ENGINE DOES NOT START

NO STARTER MOTOR RESPONSE

1. Check gearshift control levers in the NEUTRAL positions
2. Check battery condition for sufficient charge
3. Check battery cable connections tight and free from corrosion
4. Check battery switches in the ON position
5. Check starter motor and solenoid connections
6. Check ignition switch connections

STARTER MOTOR RESPONDS, BUT NO IGNITION

1. Check that fuel tanks are not empty
2. Check fuel filters and filter/water separators clean
3. Check electrical connections on engine wiring harness and ignition wiring

QUICK REFERENCE CHECKLIST (CONT'D)

G. OPERATING THE GENERATOR

STARTING THE GENERATOR

1.	Generator Seacock	Open
2.	Bilge Blowers	Run for at least 4 minutes and any time the generator is running
3.	Depress PREHEAT/ON	Preheat time should not exceed 30 seconds
4.	Depress START/RUN Switch	Depress until generator starts
5.	When the Generator Starts	Release the START switch only continue holding PREHEAT/ ON for a few seconds)
6.	Load The Generator	Turn ON the generator main breaker on the Main Distribution Panel. Turn AC breakers ON

STOPPING THE GENERATOR

1.	Breakers	Turn AC breakers OFF. Turn OFF the generator main breaker on the Main Distribution Panel
2.	Generator	Let it run a few minutes to cool down
3.	STOP Switch	Depress to stop the generator set

⚠ WARNING

Do not run the generator or engines in an enclosed area, such as a closed boat house, as there is the possibility of buildup and inhaling of carbon monoxide.

9. AFTER MARKET EQUIPMENT CHECKLIST

Any safety or operational equipment added to your boat after delivery should be checked for seaworthyness and proper working condition. Use the area below to list any equipment and the proper operating condition of that equipment before getting underway.

Equipment	Proper Operating Condition

10. MAINTENANCE LOG

Follow the recommended maintenance listed on pages 1 & 2 of this section and keep a record of this and ALL maintenance performed on your boat. You might want to copy these pages before using them to have blank ones available when these are full.

Date	Maintenance Description	Engine Hours

MAINTENANCE LOG (CONT'D)

Date	Maintenance Description	Engine Hours

Your new boat has been designed to provide you with years of enjoyment and satisfaction. In order to maintain the factory new appearance of your boat, we recommend the use of 3M™ Marine's one step Maintenance and Reconditioning Products designed specifically for pleasure boats. Following proper fiberglass maintenance guidelines will help maintain your boat's performance, value, and enjoyment.

1. Paint Cleaning Agents & Other Substances

⚠ WARNING

EXPLOSION/FIRE HAZARD

Care and refinishing materials may contain ingredients that are flammable or explosive. Do not use such materials in the bilge

Shut off electrical power and ventilate when using such materials anywhere on the boat or in the cabin.

Do not create sparks or use lighted materials.

Do not use products containing chlorine, phosphates, perfumes and non-degradable ingredients. Consult your marine dealer regarding environmental regulations before painting the hull. Fumes can last for hours, and chemical ingredients can harm people, property and the environment. Common household cleaning agents may cause hazardous reactions. Read and understand directions on all paint, cleaning and polishing materials before using.

2. Fiberglass & Gelcoat

The fiberglass hull, deck and some interior parts consist of a molded shell and exterior gelcoat. The gelcoat is the outer surface, often colored, that presents the shiny smooth appearance associated with fiberglass products. This gelcoat surface is painted or taped in some areas for styling purposes.

Wash the gelcoat and fiberglass regularly with clean, fresh water. Wax gelcoated surfaces to maintain the luster. In northern climates, a waxing at the start and end of the boating season may suffice. In southern climates, an application of wax every three months will be required for adequate protection.

⚠ WARNING

Gelcoat surfaces are slippery when wet.

Always wear non-slip footwear securely fastened to your feet and hold on to rails or the boat structrue.

⚠ WARNING

Waxed surfaces are slippery.

Do not wax areas that are usually walked on.

REFER TO THE "3M® ONE STEP MAINTENANCE AND RECONDITIONING PRODUCTS" PAMPHLET IN YOUR OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

A. Keep Bilge Area Dry

Water may accumulate in the engine room where it is not able to drain to the bilge pump. Check all areas of the engine room for accumlated water and dry throughly. Water left standing may penitrate through the gelcoated surfaces and wick into the fiberglass affecting the life of the product.

3. Stains & Scratches

Although gelcoat and painted surfaces are resistant to deep stains, a need for cleaning will occasionally arise. But, the use of some common cleaning agents will permanently discolor or otherwise damage the finish on your boat.

- Do not use abrasive porcelain-cleaning powders. These are too abrasive and contain chlorine and ammonia, either of which will permanently discolor gelcoat and paint.
- Never use nail polish remover (acetone) or any ketone solvents.
- Use diluted household detergents to remove surface soil and stains. Before using a given brand, check to make sure it contains no chlorine or ammonia.
- Alcohol can be used to remove difficult stains. But it must be promptly washed off with mild detergent and water.
- Minor scratches and deeper stains that do not penetrate the gelcoat may be removed by light sanding and buffing.

4. Permanently Moored or Docked Boats

If permanently moored in salt water or fresh water, your boat will collect marine growth on its bottom. This will detract from the boat's beauty and greatly affect its performance. There are two methods of preventing this:

- Periodically haul the boat out of the water and scrub the bottom with a bristle brush and a solution of soap and water.
- Paint the hull below the waterline with a good grade of antifouling paint. **DO NOT paint the engine drive surfaces.**

NOTE: There are EPA regulations regarding bottom paint application. Consult your Sea Ray® dealer for proper application methods.

5. Care for Bottom Paint

From time to time a slight algae or slime forms on all vessels. The bottom painted portion of the hull can be wiped off with a coarse turkish towel or a piece of old rug while the boat is in the water. Do not use a stiff or abrasive material to clean the bottom paint.

The bottom paint should be inspected annually. If it needs repainting consult your Sea Ray® dealer.

6. Topside Areas

A. Stainless Steel and Alloy Fittings

Stainless steel and alloy fittings should be cleaned with soap and water or household glass cleaner. Remove rust spots as soon as possible with a brass, silver or chrome cleaner. Irreversible pitting will develop under rust that remains for any period of time. Never use an abrasive like sandpaper or steel wool on stainless. These may actually cause rust. To help protect the stainless, we recommend the use of a good car wax.

B. Salt Crystals

When instruments are exposed to a saltwater environment, salt crystals may form on the bezel and the plastic covers. These salt crystals should be removed with a soft, damp cloth; never use abrasives or rough, dirty cloths to wipe plastic parts. Mild household detergents or plastic cleaners can be used to keep the instruments bright and clean.

REFER TO THE OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

7. Gauge & Switch Panels

No special care is needed. Just wipe off with a soft, fresh water damp cloth to remove dust or salt. Dry after with chamois or soft cloth. Use of protective chemicals is not required.

8. Acrylic Plastic Sheeting (Plastic Glass)

Never use a dry cloth or duster or glass cleaning solutions on acrylic.

To clean acrylic, first flood it with water to wash off as much dirt as possible. Next, use your bare hand, with plenty of water, to feel and dislodge any caked dirt or mud. A soft, grit-free cloth may then be used with a nonabrasive soap or detergent. A soft sponge, kept clean for this purpose, is excellent. Blot dry with a clean damp chamois.

Grease and oil may be removed from acrylic with kerosene, hexane, white (not aviation or ethyl) gasoline or aliphatic naphtha (no aromatic content).

Do not use solvents such as acetone, silicone spray, benzine, carbon tetrachloride, fire extinguisher fluid, dry cleaning fluid or lacquer thinner on acrylic, since they attack the surface.

Remove fine scratches with fine automotive acrylic rubbing and polishing compounds.

9. Canvas and Clear Vinyl

Do not fold or store any of the canvas pieces while wet. All canvas should be rolled or folded when dry and stored in a clean, dry place. For clear vinyl pieces, the recommended methods for storage are rolling or laying down flat. The clear vinyl should never be folded or creased as cracking will result. To protect the clear vinyl from rubbing against itself while rolled or stored flat, place a piece of very soft, nonabrasive cloth between the pieces. If the surface of the clear vinyl becomes scratched, the canvas manufacturer has provided a canvas care sheet located in your Owner's Manual Packet. When storing the rear (aft) curtain, fold the canvas over the clear vinyl window (do not fold clear vinyl), then roll or store flat.

The fabric should be cleaned regularly before substances such as dirt, pollen, etc. are allowed to accumulate on and become embedded in the fabric. The fabric can be cleaned without being removed from the installation. Simply brush off any loose dirt, particles, etc.; hose down and clean with a mild solution of a natural soap in lukewarm water (no more than 100°F, 38°C); rinse thoroughly to remove soap. DO NOT USE DETERGENTS. Allow to completely dry.

Wash and clean vinyl windows with a warm soap solution. Use a soft cloth or sponge and do not scratch the surface.

If you have stubborn cleaning cases, call your dealer for proper procedures. Do not try your own cleaning procedures as they may permanently damage the canvas.

After each use, especially in salt water areas, rinse the canvas completely with fresh cold water. Then let the canvas dry completely before stowing.

All metal components of the canvas should be rinsed with fresh cold water and exposed components wiped dry to maintain appearance and working order.

10. EXTERIOR UPHOLSTERY FABRIC

Exterior fabrics should be cleaned with a sponge or very soft scrub brush and a mild soap and warm water solution. After scrubbing, rinse with plenty of cold, clean water and allow the fabric to air dry in a well ventilated place, preferrably away from direct sunlight.

Mildew can occur if your boat does not have adequate ventilation. Heat alone will not prevent mildew; you must also provide for fresh air circulation.

REFER TO THE OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND WARRANTY INFORMATION.

11. INTERIOR UPHOLSTERY FABRIC

Cleaning and maintenance information provided by the material manufacturer, is in your Owner's Manual Packet.

NOTICE

Always clean spots, stains, etc., immediately. Test an unseen area of fabric before cleaning stain, to insure that cleaning material will not cause damage.

REFER TO THE OWNER'S MANUAL PACKET FOR INSTRUCTIONS AND OTHER CLEANING INFORMATION.

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